APRIL 7, 1945

Railway Age

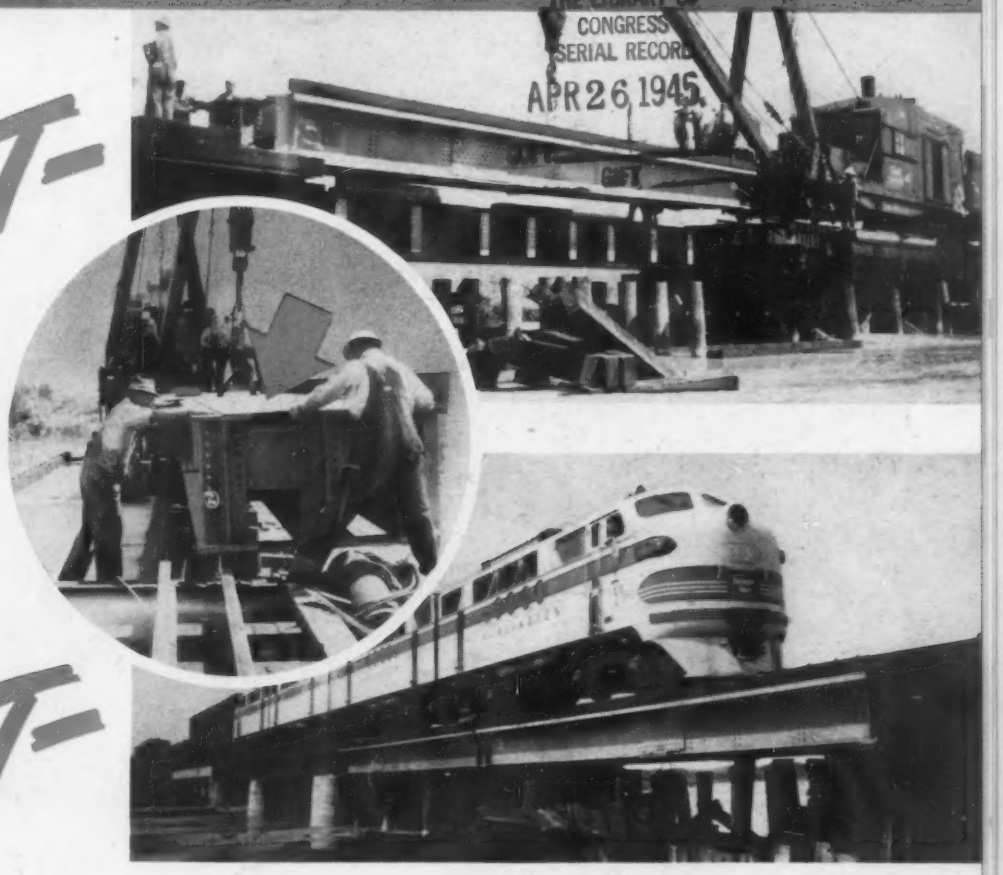
Founded in 1856

THE LIBRARY OF CONGRESS SERIAL RECORD
APR 26 1945
GIFT

To make it FAST-

Prefabricated Ballast Deck Design—

To make it LAST-



BYERS WROUGHT IRON DECK PLATES

This bridge at Parks, Nebraska, is one of a pair recently built by the Chicago, Burlington and Quincy Railroad. It illustrates two points of interest to every maintenance-of-way engineer: how prefabrication has been utilized to permit replacement of bridges almost literally "between trains," and how Byers Wrought Iron has been utilized to decrease repairs and replacements of decking.

Ballast-type deck bridges have been widely used for years, because the minimum depth of floor reduced fill in approaches, and excavation to provide clearance. By securing deck plates to the girders, entire sections can be lifted into place, and ties, rails and ballast can follow right behind the crane.

Decks are exposed to severe corrosive attack from brine drippings, run-off water, and other sources, and since painting is not practical, an inherently corrosion-resisting material must be used. In countless instances within the last decade Byers Wrought Iron has been installed in modern structures and its condition today merely substantiates the evidence of old wrought iron structures that are familiar to every railroad man. Wrought iron's durability comes of course from its unique structure . . . tiny fibers of glass-like silicate slag threaded through a matrix of high-purity iron. The fibers halt and deflect attack, discouraging pitting. They also help to anchor the initial protective film, which shields the underlying metal.

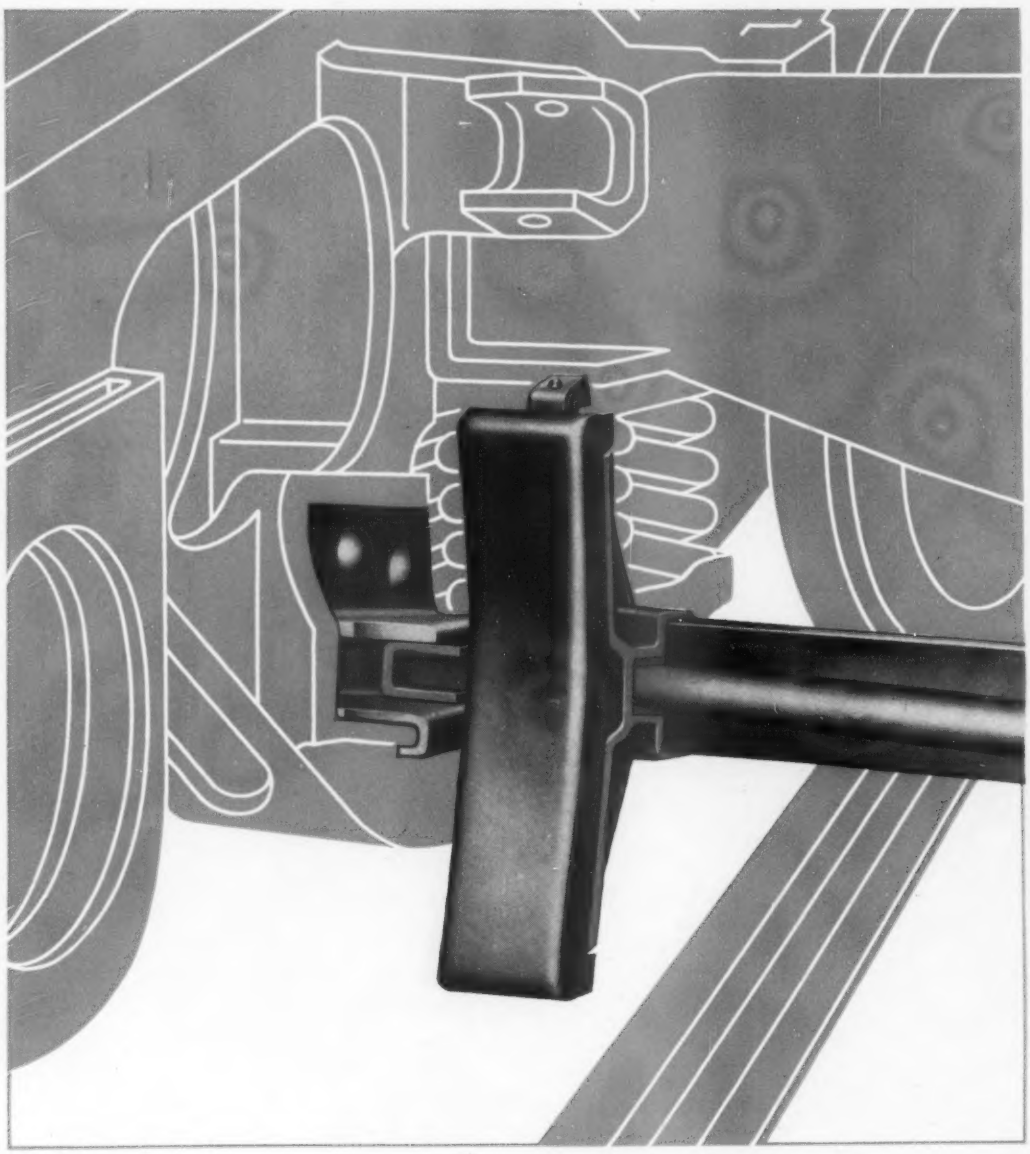
Our bulletin, "Wrought Iron in Bridge Construction," has an interesting section on ballast-type deck bridges, as well as other helpful material. Would you like a copy? Just write.

A. M. Byers Co., Pittsburgh, Pa. Established 1864. Boston, New York, Philadelphia, Washington, Chicago, St. Louis, Houston, Seattle, San Francisco.

BYERS
GENUINE WROUGHT IRON
TUBULAR AND HOT ROLLED PRODUCTS
ELECTRIC FURNACE ALLOY STEELS · OPEN HEARTH ALLOY STEELS
CARBON STEEL TUBULAR PRODUCTS

CORROSION COSTS YOU MORE THAN WROUGHT IRON

UNIT TRUCK



Have You Seen Anything Better?

UNIT TRUCK CORPORATION

140 CEDAR STREET NEW YORK, 6, N. Y.

Published weekly by Simmons-Boardman Publishing Corporation, 1309 Noble Street, Philadelphia, Pa. Entered as second class matter, January 4, 1933, at the Post Office at Philadelphia, Pa., under the act of March 3, 1879. Subscription price $6.00 for one year U. S. and Canada. Single copies, 25 cents each. Vol. 118, No. 14.

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N. Y.

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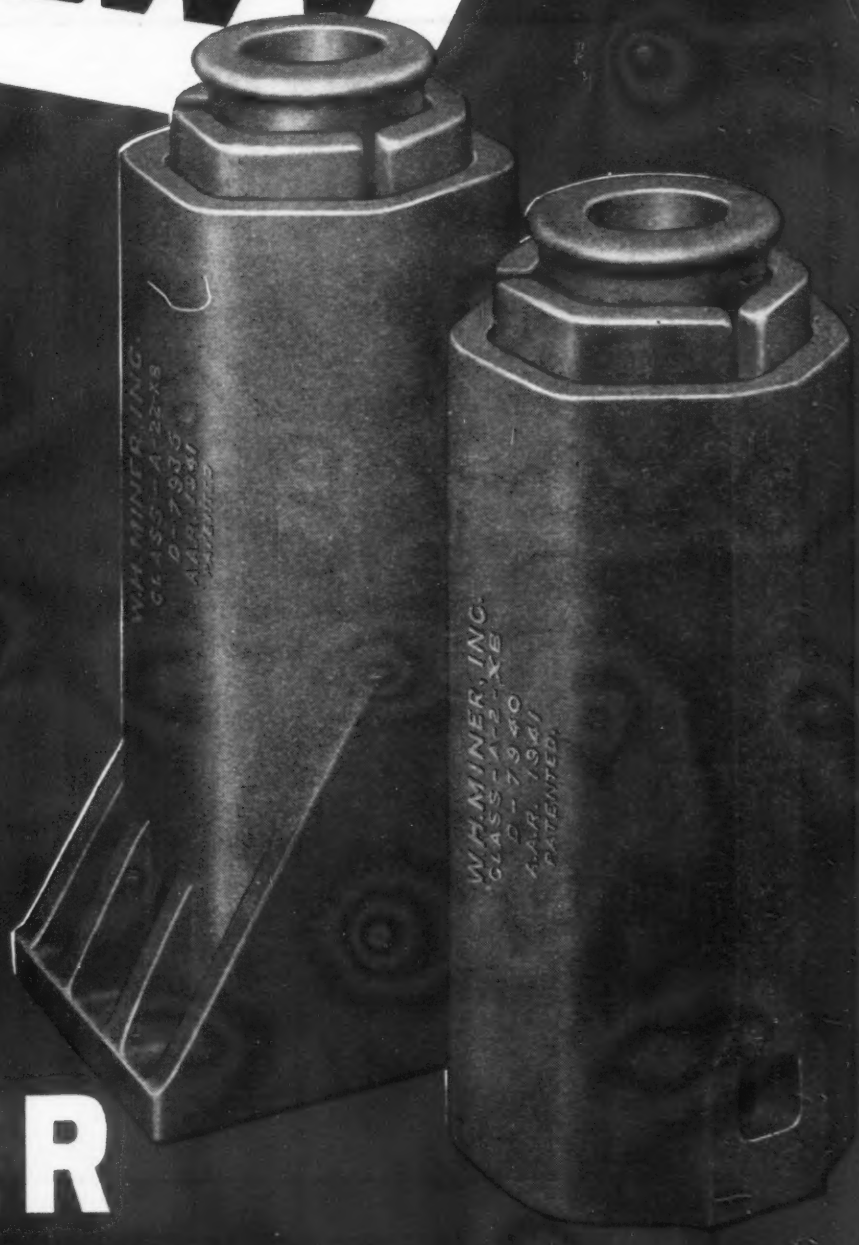
RAILWAY AGE

QUALITY



MINER

FRICTION DRAFT GEARS

POSITIVE IN ACTION

STURDY

ABSOLUTELY RELIABLE

W. H. MINER, INC. CHICAGO

out of the past . . . come the

POSTWAR PASSENGERS WILL PATRONIZE CARRIERS THAT OFFER THE MAXIMUM COMFORT, SERVICE, SPEED AND SAFETY.

Modernize with

Westinghouse

PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE

Modern conveniences of today

WESTINGHOUSE RAILROAD WATER COOLERS...a necessity for passenger comfort

Postwar passengers will expect and demand the utmost in travel comfort and convenience. Railroad executives, fully aware of the severe competition of the future . . . are planning modernization of equipment and improved service to secure a full share of passenger traffic and revenue.

One of the most important comfort requirements is an adequate supply of pure, fresh, cold drinking water. The new Westinghouse Railroad Water Cooler is the answer . . . and is the result of years of experience in designing and building various types of water coolers.

The combined ideas of fifteen leading railroads were incorporated in this new custom-built cooler. For maximum efficiency and reliability include Westinghouse Railroad Water Coolers in your plans. Ask your Westinghouse Office for details and specifications.

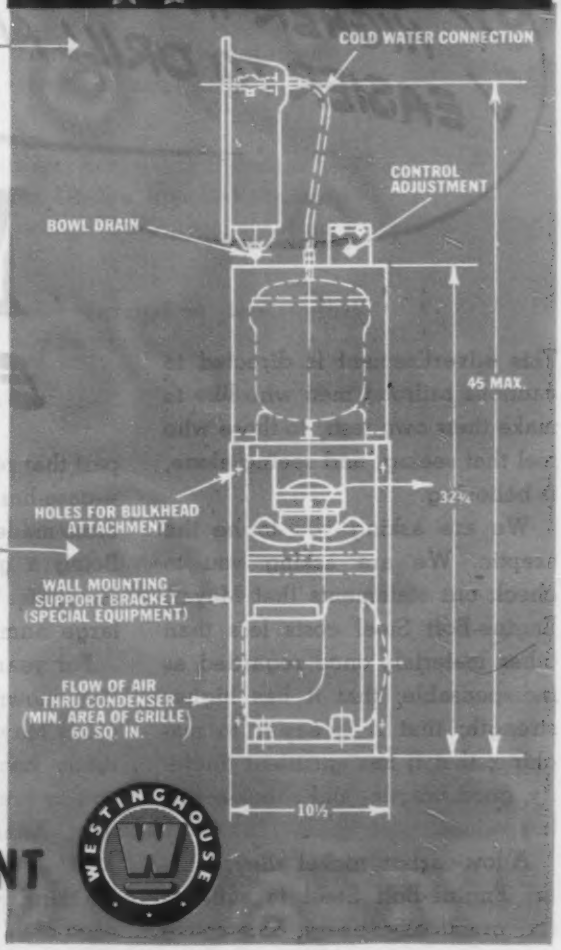
MODERN DESIGN, RUGGED CONSTRUCTION, FEATURES OF WESTINGHOUSE ELECTRIC DRINKING WATER COOLERS

1. **HERMETICALLY-SEALED** at the factory. After mounting the unit, only water and electrical connections need be made. No shafts, belts, pulleys or expansion valves to get out of order.

2. **CONVENIENT MOUNTING**—unit is compact and can be mounted either on the floor or wall in a concealed location. Easily and quickly installed. Spigot and bowl assembly are installed separately from the unit.

3. **CAPACITY**—ample cooling facilities provide 4 gals. of water per hour cooled from an inlet temperature of 80° F. to 50° F. drinking water temperature at 90° room temperature.

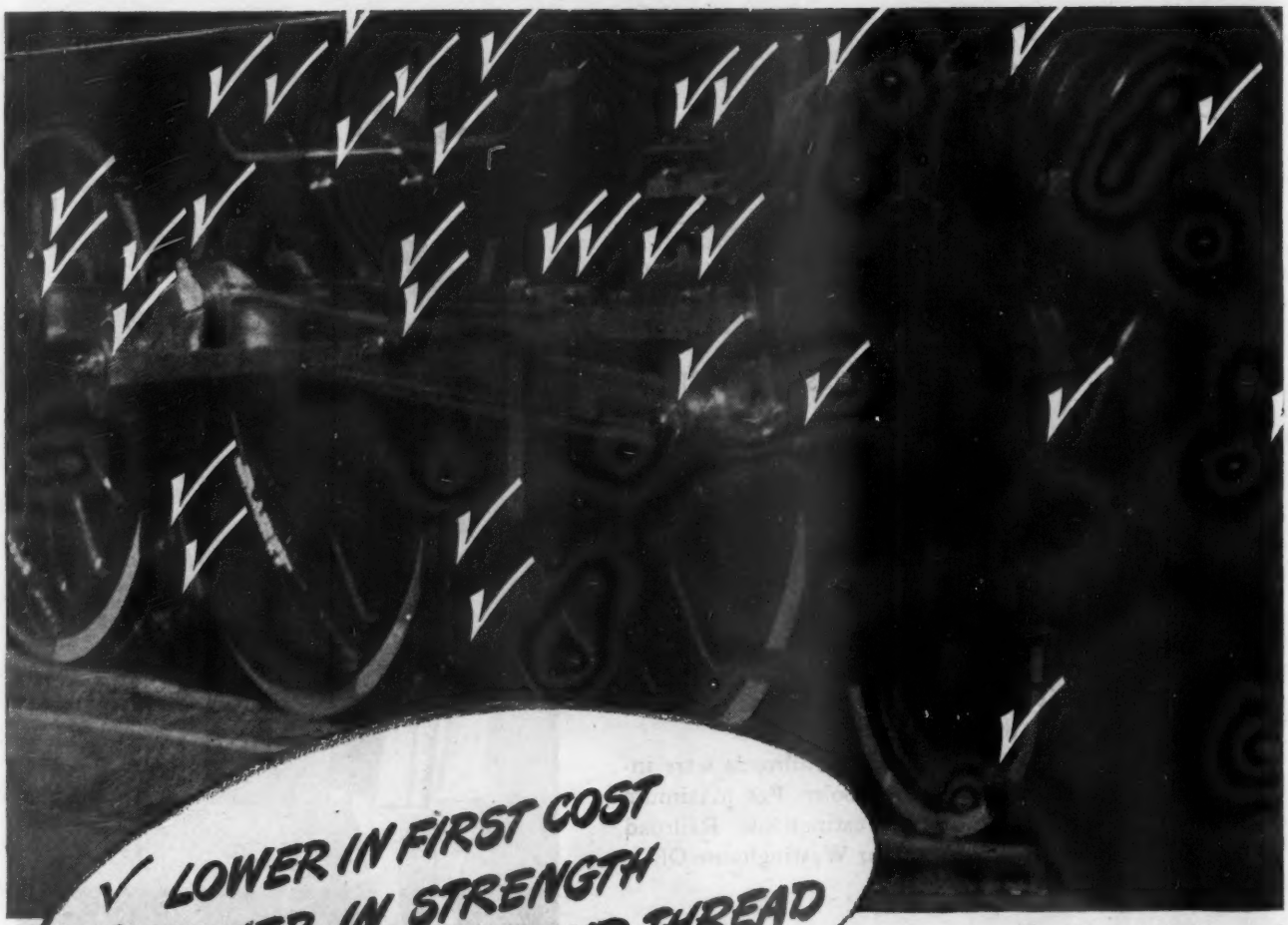
4. **LUBRICATION**—a permanently sealed-in oil supply, splash system for the compressor with the fan permanently oiled.



CONSULT WESTINGHOUSE

—on your plans for passenger car modernization. Available are axle-driven generators and control for high-speed operation; compressor motor and control; fluorescent lighting equipment; Precipitron for electrostatic air cleaning of cars; water coolers; "De-ion" circuit breakers; and other equipment for efficient car operation. Westinghouse Electric & Manufacturing Co., P. O. Box 868, Pittsburgh 30, Pa. J-95099

RAILROAD ELECTRICAL EQUIPMENT



✓ LOWER IN FIRST COST
✓ HIGHER IN STRENGTH
✓ EASIER TO DRILL AND THREAD

One low-cost steel for all of the parts marked with a ✓

MAYARI
ENGINE-BOLT STEEL

This advertisement is directed to cautious railroad men who like to make their own tests; to those who feel that seeing, and seeing alone, is believing.

We are asking you to be the skeptic. We are asking you to check our statements that Mayari Engine-Bolt Steel costs less than other materials once regarded as indispensable; that it has higher strength; that it is easier to machine; that it has excellent ductility, good fatigue- and shock-resisting values.

A low-carbon nickel alloy, Mayari Engine-Bolt Steel is suitable for practically every locomotive part that requires quality bar stock —case-hardened parts as well as those made from as-rolled material. Being a general-purpose steel, it eliminates the need for stocking a large number of different grades.

For years some of the country's best-known railroads have been using Mayari extensively. They already know what we are asking you to prove to your own satisfaction. After you have given this steel a thorough, impartial trial, we think you will agree with us on each of its points of superiority.

As your first step in making such a test, call in the nearest Bethlehem representative. You will be interested in what he has to say.

BETHLEHEM STEEL COMPANY
GENERAL OFFICES: BETHLEHEM, PA.

Bethlehem Steel Export Corporation
New York City

BETHLEHEM STEEL

489-0 IS KNOCKED OUT—AND IN AGAIN

Thirty-two years of roadbed work have taught Section Foreman N. G. Nelson a lot about tricky streams. He's learned it the hard way, along the eastern rim of the Missouri River Valley north of Omaha, on the Illinois Central.

It's a region of steep hills, heavy rains and flash floods, particularly near his home at Logan, Iowa. In no time at all, creeks can become rivers, and rivers can become torrents.

Like Timber Creek, for example. That's five miles west of Logan.

Section Foreman Nelson woke up that Sunday morning in the midst of a cloudburst that meant trouble. Calling two of his men, they started west on their motor, watching the rails and both sides of the track.

At 10 o'clock they reached Bridge 489-0. High water and driftwood had pushed the bridge out of line! Sending one of his men across to flag anything eastbound, Nelson hustled back to Logan where he notified the chief dispatcher at Waterloo to protect any trains coming from that direction.

By that time Track Inspector Don Peel had reached Bridge 489-0 from Council Bluffs—just as a big tree, riding the flood of Timber Creek, knocked a thirty-foot I-beam out of the bridge and carried it downstream!

Bridge 489-0 was out, and no mistake. On both sides of it, long trains of wartime freight were sidetracked.

Track Inspector Peel wired a report of the damage to the superintendent at Waterloo, who promptly highballed a pile driver and emergency materials to the scene of trouble.

It was a job for trackmen who were used to emergencies. Forgetting the clock and knuckling down to their job, they replaced the lost I-beam, knocked the bridge back into place, straightened the track—and let stalled traffic through at noon the next day.

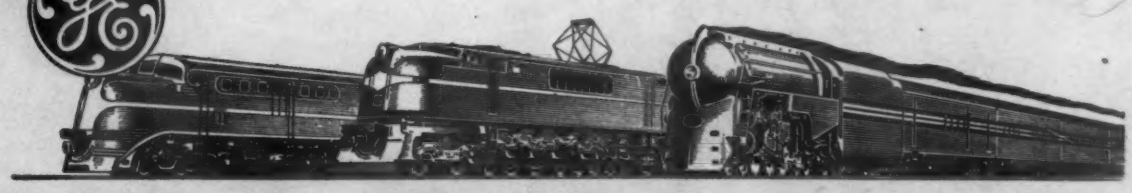
American railroads' low ratio of accidents to miles traveled on overcrowded wartime tracks is one of the wonders of this day and generation.

*—The Trackwalker**

★ ★ ★

Covering periods up to eight years, the total of all locomotive operating expenses, less wages, for fifty-four Alco-G.E. 660-hp diesel-electrics averaged only 40 per cent of the same costs for steamers.

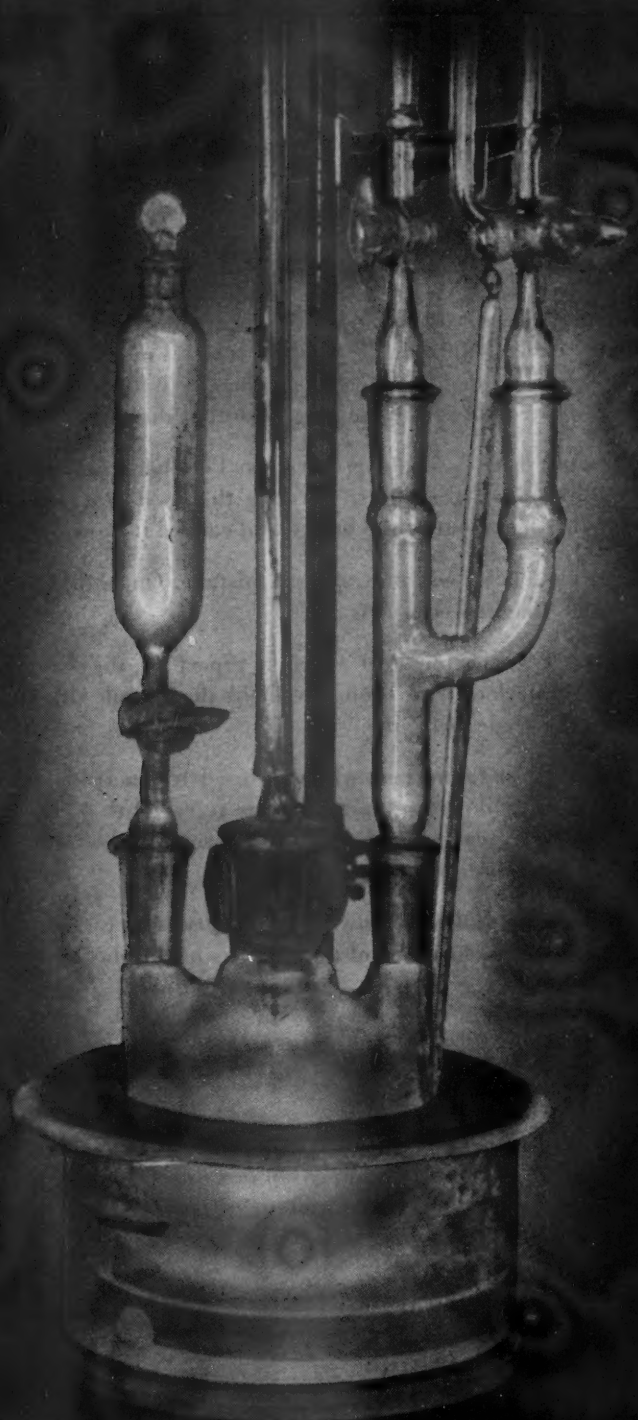
Alco GE



AMERICAN LOCOMOTIVE • GENERAL ELECTRIC

Copr., 1945, American Locomotive Company and General Electric Company **Reg. U.S. Pat. Off.* 118-130-9600

TO RESIST



Electronic bombardment of high voltage cable oil under vacuum at 10,000 volts, a test as unique as it is purposeful, is but one indication of the searching investigations here undertaken.

VOLTAGE...

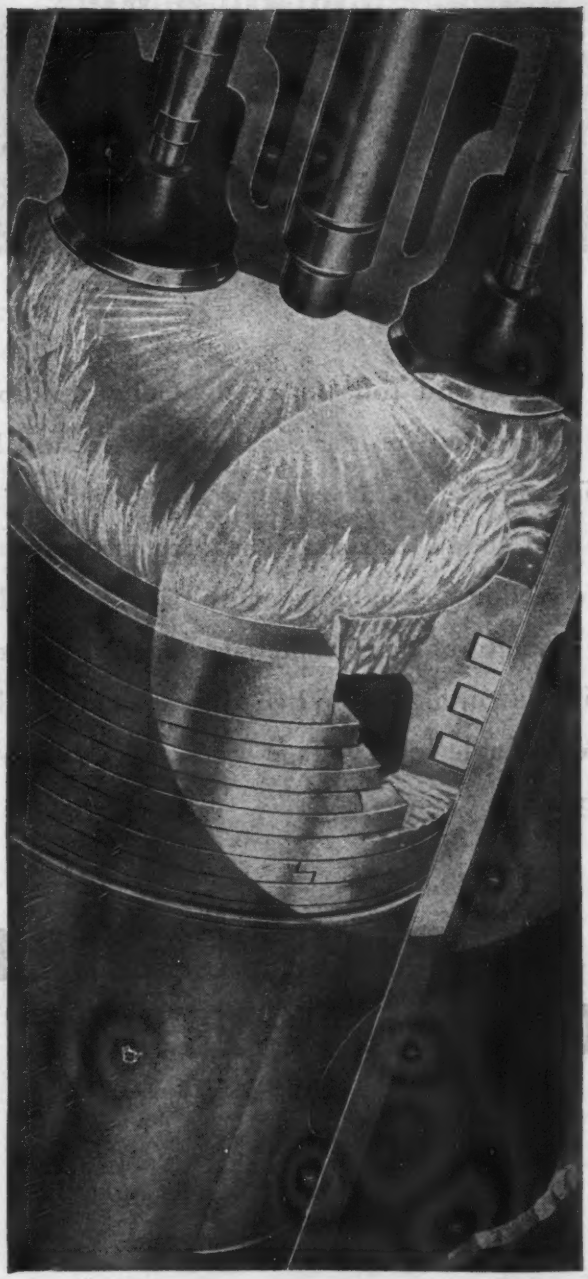
Here, wire and cable Research tests every component beyond the severest demands of service-in-the-field.

Looking far beyond today's needs, General Cable Research is prepared for the days when there will be commercial application of voltages beyond those of yesterday and today. Research endeavor is exploring in many directions, examining many products, evaluating the stability of many materials under the severest conceivable conditions. When the demand can be met, General Cable high voltage wires and cables will be available.

GENERAL CABLE CORPORATION

Manufacturers of Bare and Insulated Wires and Cables for Every Electrical Purpose

KEEP TRACKS CLEAR
INSIDE YOUR EQUIPMENT!



DIESEL AVAILABILITY—

and Track-Tool Efficiency are both greatly increased with Quality Railroad Lubricants by SOCONY-VACUUM!

● The cutaway at left spotlights the ring zone of a big Diesel. Here oil fights terrific pressures, and heat that shoots past 3500°F.

Gargoyle D.T.E. Oils (Nos. 1 to 5) resist these destructive forces, help keep rings free in their grooves, reduce cylinder and ring wear to a minimum.

These oils prevent hard-carbon deposits and any deposits that do form are soft and fluffy. Their strong protective film provides maximum lubricity.

These famous oils are also setting high performance records in large stationary and marine Diesels.

For your high-speed, automotive-type Diesels, Delvac 900 Series Oil gives this same high performance.

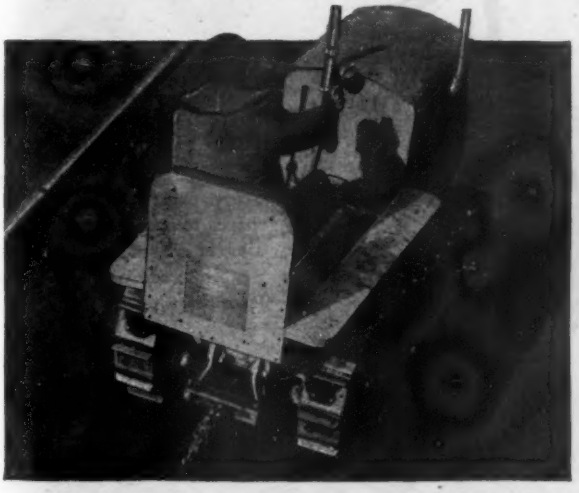
You'll keep Main Line and Maintenance-of-Way Diesels at peak efficiency with these proved oils.

SOCONY-VACUUM OIL COMPANY, INC.
Standard Oil of N.Y. Division · White Star Division · Lubrite Division · Chicago Division · White Eagle Division · Wadhams Division · Magnolia Petroleum Company · General Petroleum Corporation of Calif.

COSTS HELD DOWN ON ROADWAY MAINTENANCE

Working in close cooperation with makers of maintenance-of-way equipment, Socony-Vacuum has developed special oils and greases that assure efficient, low-cost operation of all tools and their motors.

On air-driven tools, above, Socony-Vacuum oils resist the washing action of water...protect vital parts against wear and rusting. Other quality lubricants are equally effective for air compressors and other equipment.



TRACTORS. Socony-Vacuum engine oils provide excellent protection against wear, help keep engines clean and contribute toward lower maintenance costs. Special chassis greases provide good lubrication, seal out grit, dirt, water from all fittings.

HEAVY EQUIPMENT. For railroad cranes and other heavy equipment your Socony-Vacuum Representative will gladly recommend lubricants that provide protection for engines, transmissions, heavy exposed gears.

GARGOYLE

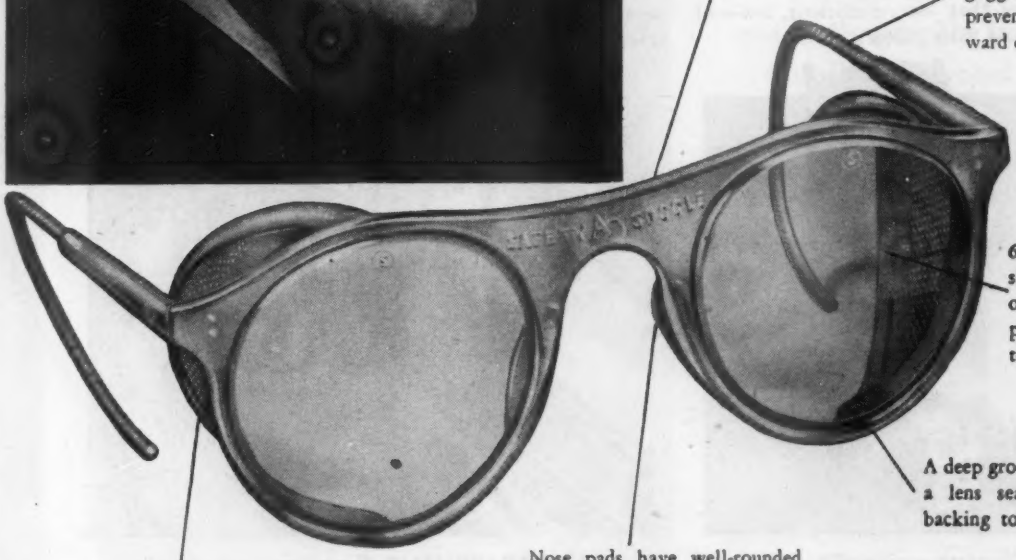
Railroad Lubricants

IT PAYS TO KNOW WHAT'S NEW IN LUBRICATION

SOCONY-VACUUM OIL COMPANY, INC.

TUNE IN "INFORMATION PLEASE"—MONDAY EVENINGS, 9:30 E.W.T.—NBC

6 FEATURES make AO FUL-VUE ACETATE GOGGLES..... SAFE, COMFORTABLE, ATTRACTIVE



Stronger, more sturdy front than on ordinary acetate frames. Bridge has a slight amount of face form to give added side protection.

Comfort cable temples hold goggles snugly in position—prevent them from sliding forward on nose.

6-curve Super Armorplate lenses shaped to conform to and cover orbit of eye, provide maximum protection and vision, plus better appearance.

A deep groove in lens rim forms a lens seat with substantial backing to resist *severe* impact.

Nose pads have well-rounded edges and ample flare to withstand ordinary jolts and blows.

Acetate side shields protect against particles striking from sides. Perforated to provide ventilation and help keep lenses from fogging.

AO Ful-Vue Acetate Goggles come in three eye sizes and three bridge sizes—made in transparent acetate, with or without side shields, with clear or Calobar 6-curve Super Armorplate lenses. Your nearest AO Representative can supply you. Call him today.

American Optical
COMPANY
SOUTHBRIDGE, MASSACHUSETTS

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DESIGNERS AND MANUFACTURERS

of Freight Cars of All Types Including Air Dump Cars

Magor Car Corporation with over forty years experience in design and construction of freight cars is ready at all times to cooperate with American railroads in car building problems.

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MAGOR CAR CORPORATION

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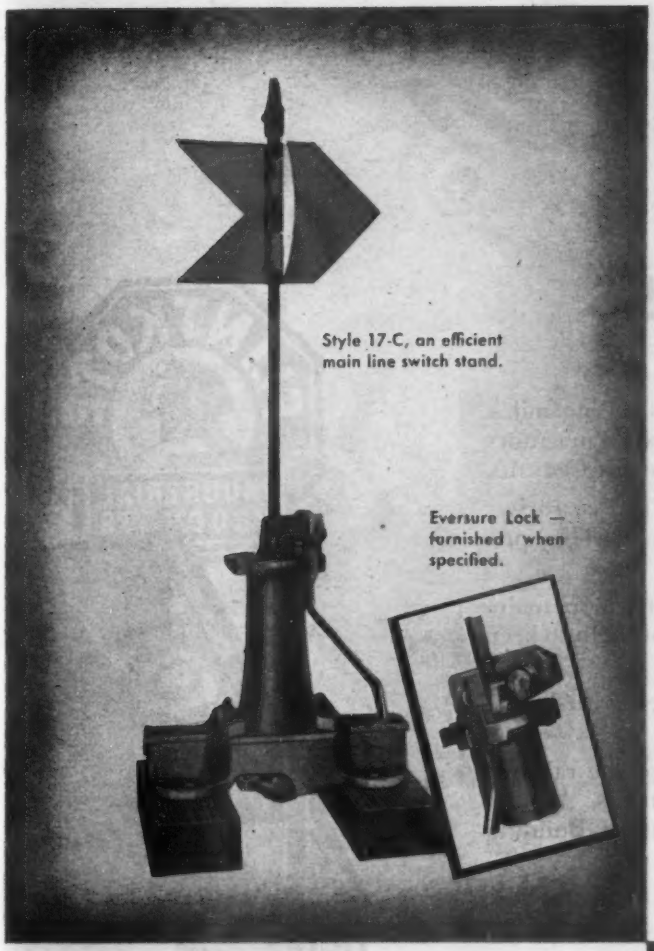
EXIDES—POWERED TO MEET THE RAILROAD'S INCREASING BATTERY NEEDS

In the fine, swift, comfortable trains of the coming era in railroad transportation, electricity will play an increasingly important part. And powerful, rugged Exide Batteries will be ready to take on the added duties assigned to them.

Since 1891, Exide Batteries have been serving America's railroads. Today, they provide dependable lighting, even during long stops. They supply power for air-conditioning cars; for cranking Diesel engines, for operation of train communications, signal systems, and other tasks. Exides do these jobs dependably with long-life and ease of maintenance. When you buy an Exide, you *Buy* to *Last.*

THE ELECTRIC STORAGE BATTERY CO.
Philadelphia 32
Exide Batteries of Canada, Limited, Toronto



EMERGENCY PROTECTION FOR TRAILED-THROUGH SWITCHES

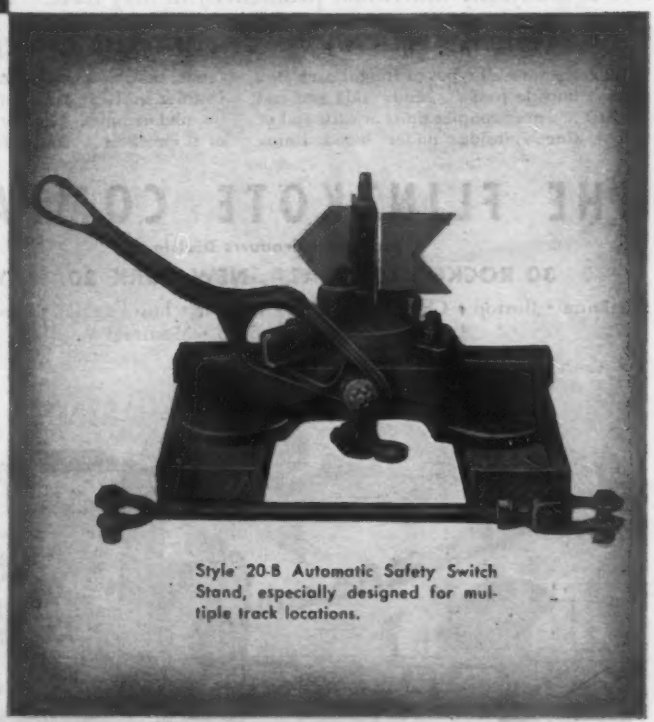
RACOR

automatic safety switch stand

Racor Automatic Safety Switch Stands all share the special Racor feature of being absolutely rigid for hand operation but always set for automatic action whether locked or not. If a train trails through, the switch is automatically thrown to the opposite position by the wheel flanges.

The 17-C Racor Automatic is recommended for main line tracks. The target has good visibility and the height is convenient for hand operation. Eversure lock can be furnished when specified, to eliminate padlocks.

The 20-B Automatic is recommended for multiple-track locations, such as yards. The low target always indicates true position of the switch. This switch promotes economy by eliminating expensive repairs often caused when rigid stands are trailed. A hook or padlock may be applied in the locking eye after hand throw is completed.



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Spray on

ADDITIONAL MILES

Miles and miles . . . millions of them.

Basically that's a railroad's business . . . buying and selling miles. Rolling stock represents an inventory of miles . . . a flexible inventory that can be stretched to your advantage with Flintkote Car Cements.

These asphalt-base compounds resist wear, abrasion and *corrosion.* They "plate" surfaces with resilient, long-wearing armor. They preserve strength for additional miles of pay load.

Today those miles are especially precious, and more and more maintenance men are discovering that Flintkote Car Cements help to keep cars out of the shop.

Flintkote Car Cements are easily and quickly applied with brush, trowel or spray . . . few hours and the job is done.

For over 40 years The Flintkote Company has served the railroad industry by supplying quality products in Car Cements, Asphalt Protective Coatings, Mastic Flooring, Insulation Coating, Building Materials.

Our Railway Division will be glad to send you full information, or to study any individual problems you may have.

TYPICAL APPLICATIONS OF FLINTKOTE CAR CEMENT

Underframes—all types of freight cars. Box Cars—outside roof . . . ends (side and end posts) . . . over coupler units at each end of floor line . . . inside, under wood lining (ends, sides and roof). Gondola Cars—over coupler units at each end of floor line . . . on underframes. Hopper Cars—underside of slope sheet . . . underframes . . . couplers.

THE FLINTKOTE COMPANY

Industrial Products Division

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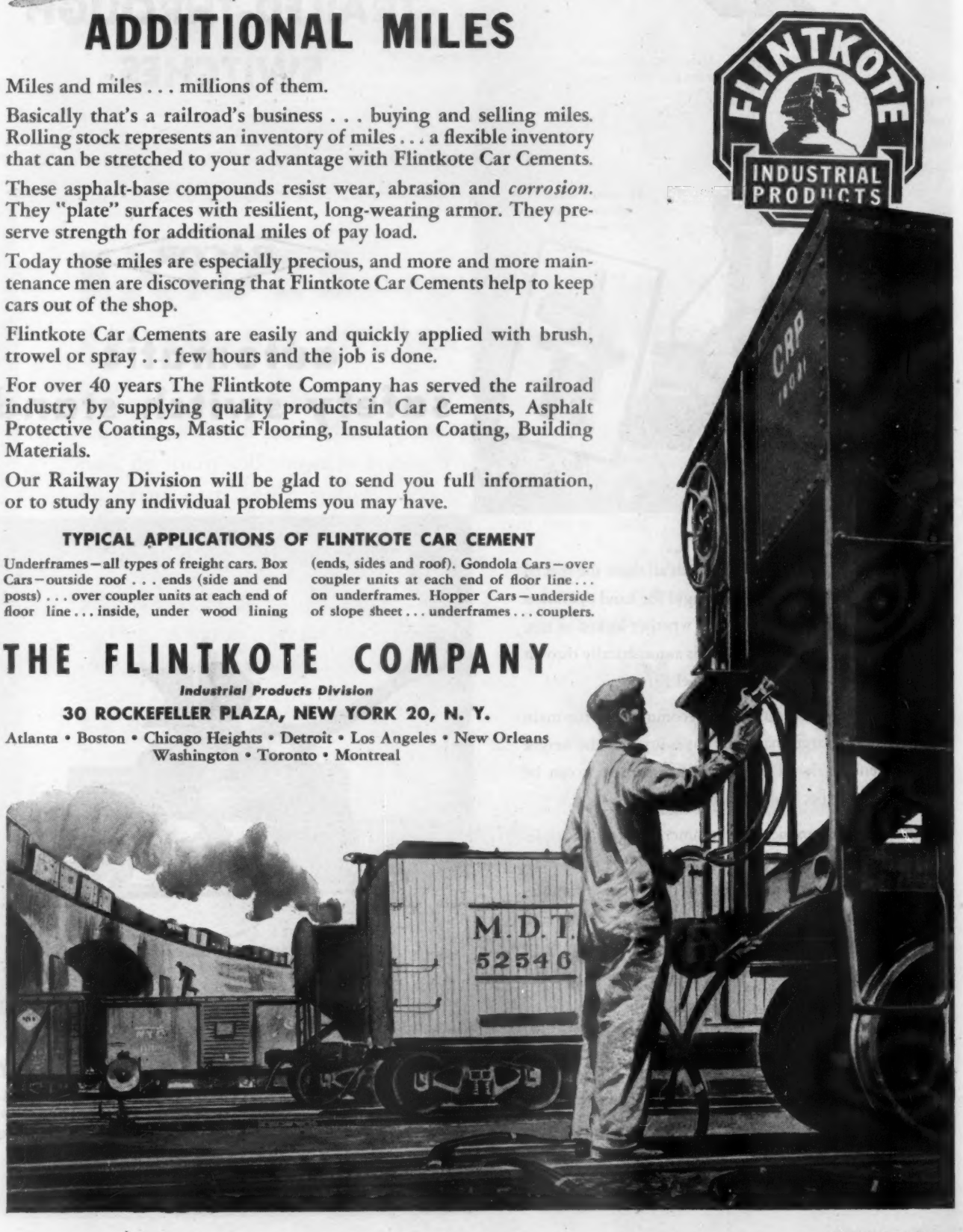


2 Reasons why

RED LEAD

means Extra Rust Protection . . .

Why is Red Lead so widely accepted throughout industry as *The* metal protective paint?

Why are paints containing Red Lead so generally specified for safeguarding metal surfaces from the costly ravages of rust?

The reasons are many, but none are more noteworthy than Red Lead's ability to counteract acid conditions and to halt electrochemical action—both prime causes of rusting—as explained at right.

Still another important advantage of Red Lead is that it partially combines with the usual vehicles to form compounds generally known as "lead soaps." Due to their composition and the individual way in which these compounds form, the film obtained is highly water-resistant. In addition, lead soaps contribute to the formation of tough, elastic films that "stick on the job."

Remember, too, that Red Lead is compatible with practically all vehicles commonly used in metal protective paints, including phenolic and alkyd resin types.

Specify Red Lead for ALL Metal Paints

The value of Red Lead as a rust preventive is most fully realized in a metal paint where it is the only pigment used. However its rust-resistant properties are so pronounced that it also improves any multiple pigment paint. No matter what price you pay, you'll get a better metal paint if it contains Red Lead.

NEUTRALIZES ACID

1 Red Lead has the ability to counteract acid conditions which are recognized as accelerators of rust. Structural steel is exposed to such environments because acid forming compounds are carried by the atmosphere in the form of gas, smoke and moisture. Red Lead has a neutralizing effect on these conditions as it is essentially a *basic* pigment with the ability to develop and maintain, for a prolonged time, a mild alkaline environment at the surface of the metal. Authoritative tests show that, as a result, Red Lead inhibits the process of corrosion. In short, metal paints, too, should "stay on the alkaline side."

2 Another outstanding reason Red Lead means *extra* rust protection is the unique way it shields metal surfaces with a protective film. Rusting is fundamentally an electrochemical process in which weak currents are generated which cause iron to become soluble in the lowest state of oxidation. Red Lead has properties through which this iron is rapidly converted to a stable compound that forms an adherent film. The formation of this protective shield halts electrochemical action, thus preventing further corrosion.

Write for New Booklet

"Red Lead in Corrosion Resistant Paints" is an up-to-date, authoritative guide for those responsible for specifying and formulating paint for structural iron and steel. It describes in detail the scientific reasons why Red Lead gives superior metal protection. It also includes typical specification formulas. If you haven't received your copy, address nearest branch listed below.

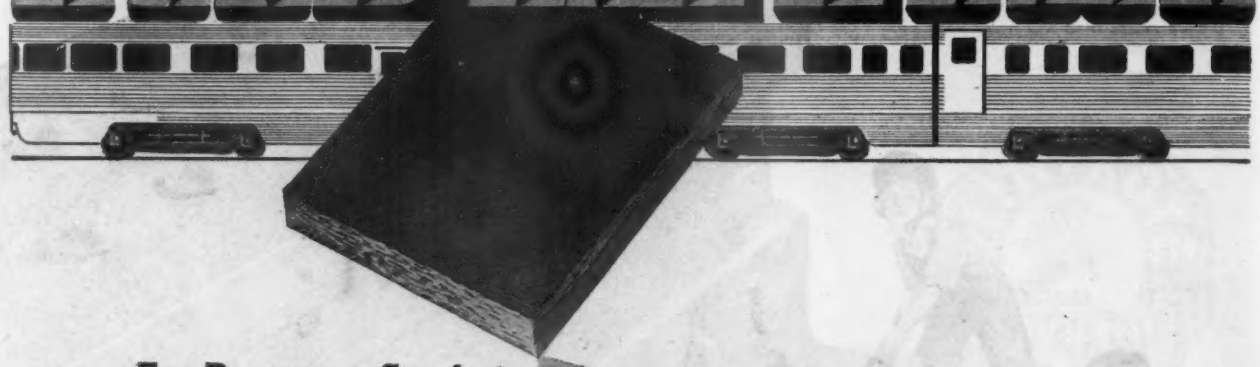
* * *

The benefit of our extensive experience with metal paints for both underwater and atmospheric use is available through our technical staff.

NATIONAL LEAD COMPANY: New York 6, Buffalo 3, Chicago 10, Cincinnati 3, Cleveland 13, St. Louis 1, San Francisco 10, Boston 6 (National-Boston Lead Co.); Pittsburgh 30 (National Lead & Oil Co. of Penna.); Philadelphia 7 (John T. Lewis & Bros. Co.)

DUTCH BOY RED LEAD

FABREEKA



For Passenger Comfort and Maintenance Reduction on New or Reconditioned Rolling Stock

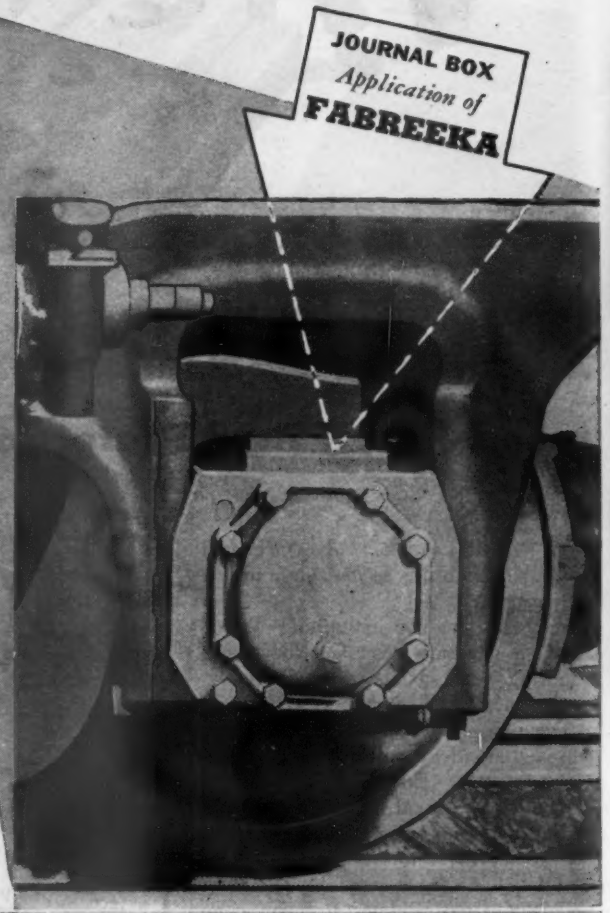
FABREEKA in the trucks of passenger cars absorbs the high frequency vibration and noise which would otherwise be transmitted through the metal parts of the truck assembly to the car body. High frequency vibration and noise result from the impact shocks encountered in the operation of the car and the rolling of the wheels on the rail.

The absorption of this high frequency vibration, a primary cause of metal fatigue, reduces maintenance.

Thus FABREEKA serves the double purpose of increasing passenger riding comfort and decreasing operating costs.

FABREEKA PRODUCTS COMPANY, INC.

BOSTON 10, MASS.



Proven in the railway field for over 10 years, experience shows that for satisfactory results FABREEKA should be used at these six important points:

1. Coil Springs 2. Center Plates ★3. Journal Boxes
4. Buffer Stems 5. Side Bearings
6. Swing Hanger Bearings (under spring plank)

Used in RAILWAY PASSENGER CARS, Trucks and Platforms . . . LOCOMOTIVES, Steam and Diesel Electric . . . TRACK CONSTRUCTION, on Bridges, Crossings, Curves, Turntables and Track Scales.

Tested in Battle

In tanks, trucks, landing craft, planes, submarines, guns and many other applications FABREEKA has performed a useful and important service for our Armed Forces.

CAST ARMOR

ROLLS ON TO VICTORY!

United States Army Medium Tanks Built with CAST ARMOR HULLS and TURRETS

☆

ONE-PIECE ARMOR CASTINGS are tough and strong and their high ballistic values and streamlined contours provide the highest protection for our tank crews. We of GENERAL STEEL CASTINGS CORPORATION take pride in our part in the development and production of these and other armor steel castings.

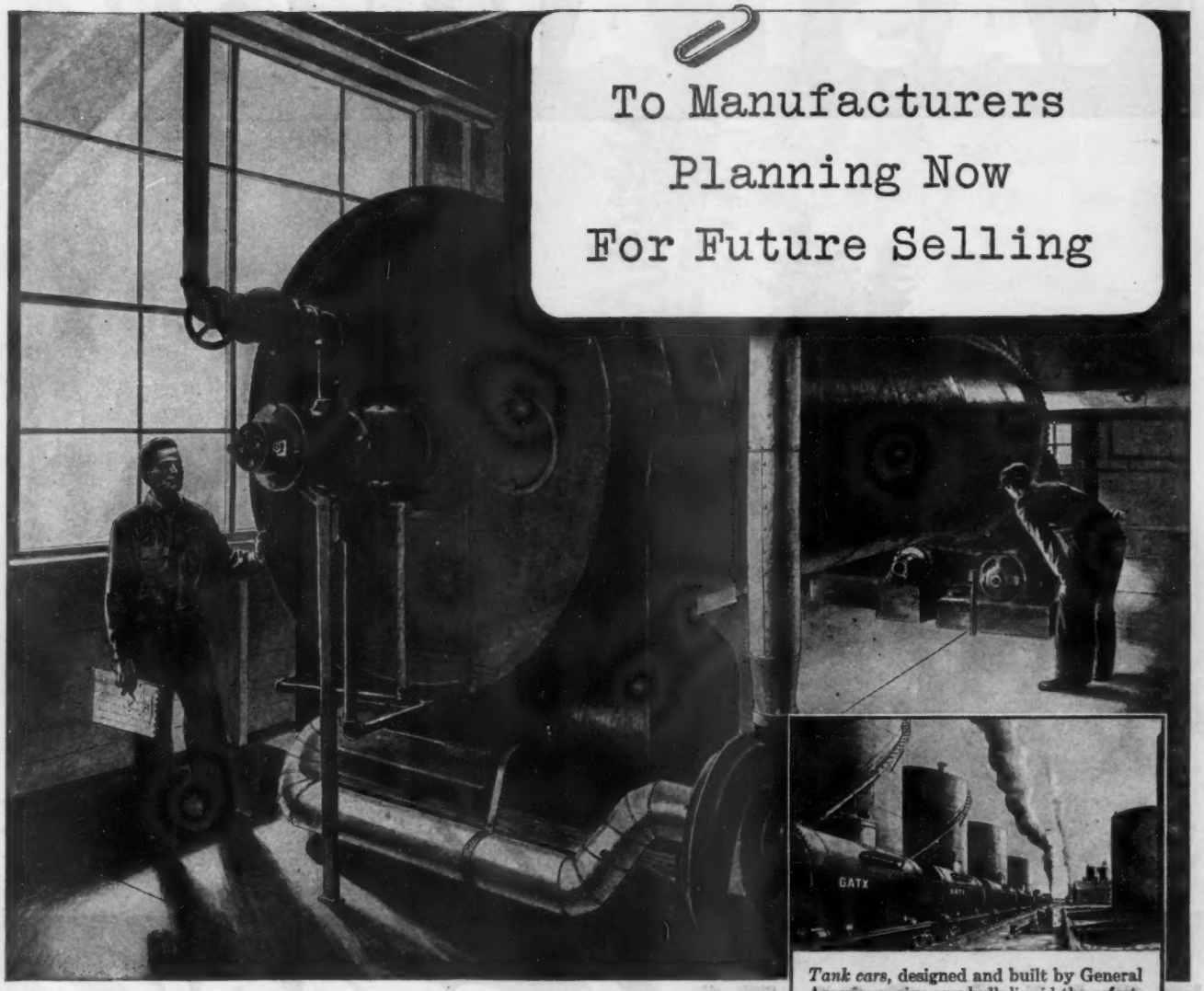
Our many years of experience in the development of special purpose cast steels and in the designing and production of COMMONWEALTH ONE-PIECE CAST STEEL DEVICES has served well. War-time advances in the design and production of steel castings will be available to peace-time Industry after VICTORY.

☆

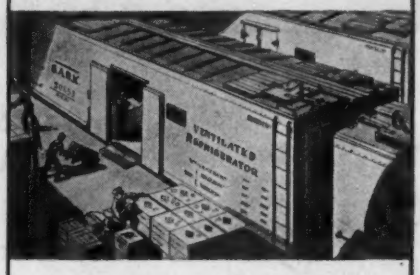
GENERAL STEEL CASTINGS

EDDYSTONE, PA. • GRANITE CITY, ILL.

To Manufacturers Planning Now For Future Selling



Tank cars, designed and built by General American, give any bulk liquid the safest, surest, most economical transportation. General American *Terminals* give bulk liquids full protection against contamination, require no investment on your part.



General American *Refrigerator Cars* insure freshness of your food products and guard flavors, for greater consumer acceptance.

How General American Engineers Can Help You

In *all* divisions, our research engineers are ready to work with you now. For example, they will design General American process equipment and installations, proven in war and peace, to be built to your exact requirements. General American equipment gives you manufacturing economies, protects your quality standards, and recovers profitable by-products.

Write for These Informative Bulletins

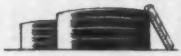
General American pressure vessels, tanks, dryers, and filters are described fully in our bulletins, Series X-45. Send for them and ask for any other desired information about our nation-wide services to all American industry.

GENERAL AMERICAN TRANSPORTATION CORPORATION

Chicago

GATX GENERAL AMERICAN

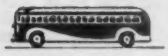
Builders and Operators of Specialized Railroad Freight Cars



Bulk Liquid Storage Terminals

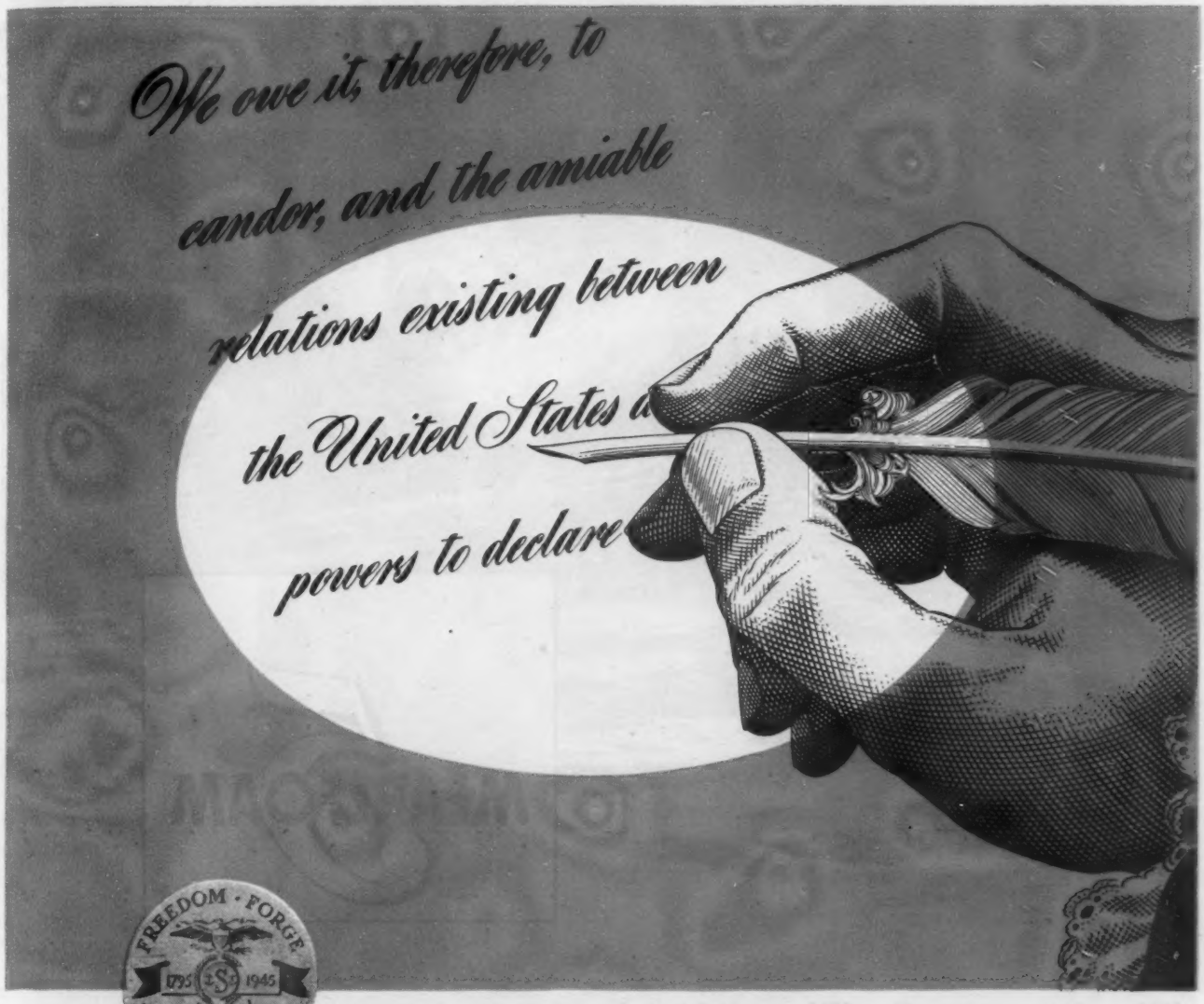
Process Equipment of All Kinds

Pressure Vessels and Other Welded Equipment



Aerocoach Motor Coaches

Precooling Service for Fruits and Vegetables



In 1823 when the Monroe Doctrine was written

Freedom Forge, then 28 years old, was producing 15 tons of blooms per week

When President Monroe scratched his signature on the doctrine that bears his name, America's industrial age was young. The first American steamboat had crossed the Atlantic only 4 years before; the opening of the Erie Canal was 2 years in the future; the safety lamp, the stethoscope, and the kaleidoscope were recent inventions. Yet Freedom Forge had already served America for almost three decades, and expanded and improved its plant by installing a stack 20-feet high and a bosh 7-feet in diameter. These developments stepped up the output to 12 to 15 tons of blooms and bar iron a week!

Both the changes and the results seem small in the light of today—but they symbolize a progressive spirit that has continuously ruled the organization. The Standard Steel Works, a direct descendant of Freedom Forge and still doing business at the original location, has pioneered methods and processes that make "Standardize on Standard" a dependable guide to the best in forgings and castings. The Baldwin Locomotive Works, Standard Steel Works Division, Burnham, Pennsylvania, U. S. A. Offices: Philadelphia, New York, Chicago, Washington, Boston, Cleveland, St. Louis, San Francisco, Houston, Pittsburgh, Detroit.

BLW THE BALDWIN GROUP

BALDWIN

STEEL FORGINGS & CASTINGS

The Source?–The SEA!

From the sea comes the special derivative which mainly is responsible for the super-effectiveness of MEARLFOAM-5, the war-born, blended multi-protein foaming agent for highspeed extinction of gasoline, oil and other serious fires.

We were able to isolate and develop its unique properties because we have been manufacturers of marine by-products since 1917, and the sea has been the source of many of our highly successful material ingredients.

MEARLFOAM-5 yields the live, lasting foam with the tough, elastic water-retaining film. The U. S. Navy uses this effective multi-protein foam extensively for preparedness—and for quickly extinguishing fires on shipboard and at shore bases. When split-seconds count — you can rely on MEARLFOAM-5 to put fire out fast—keep fire out, *permanently!*

Completely safe and non-corrosive — may be used with standard Mechanical Foam-Forming Equipment

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THE MEARL CORPORATION
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...but the Values are SPECIAL

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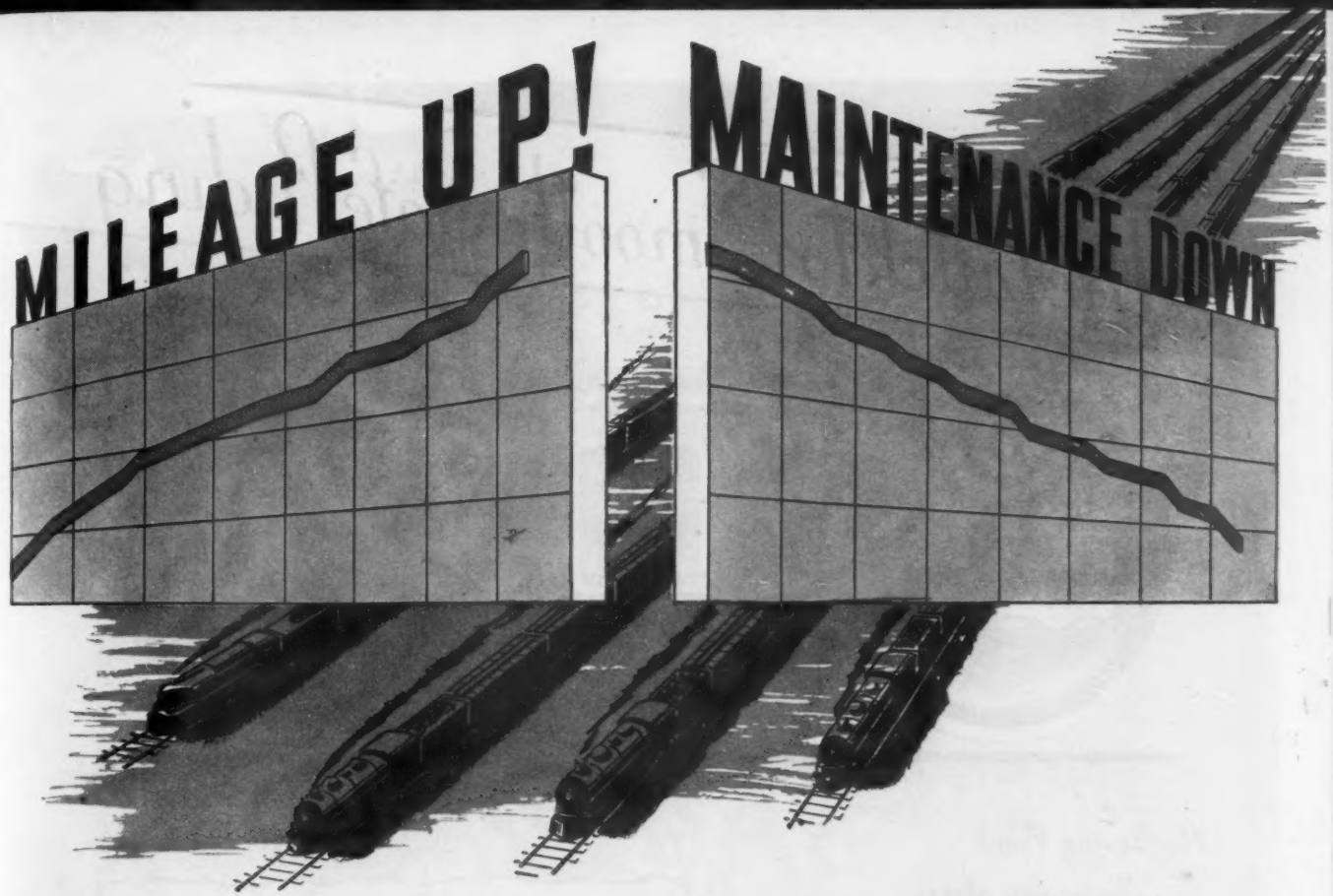
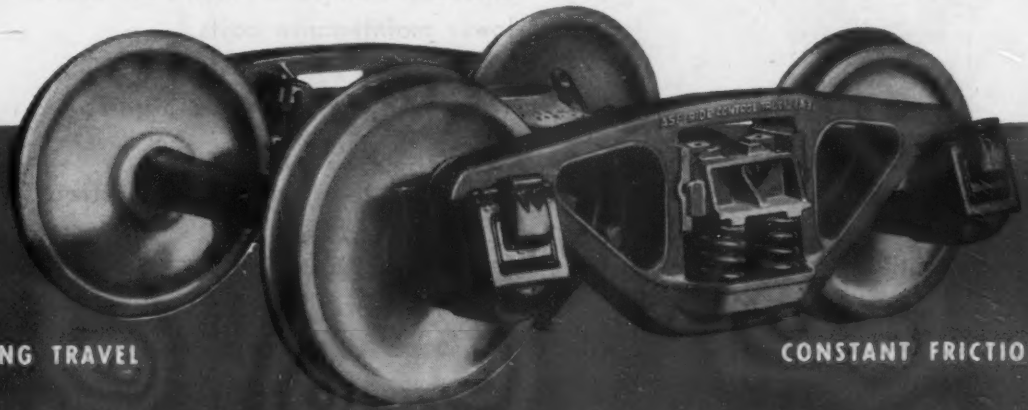


Ride-Control!

Rely upon the A. S. F. Ride-Control Truck (A-3) for an easy freight-car ride at any speed and dependability in all types of service. A simple assembly, without spring plates or spring planks, the Ride-Control Truck keeps more freight cars moving, more of the time, with minimum maintenance cost.

THE TRUCK FOR TODAY'S NEED . . . TOMORROW'S SPEED!



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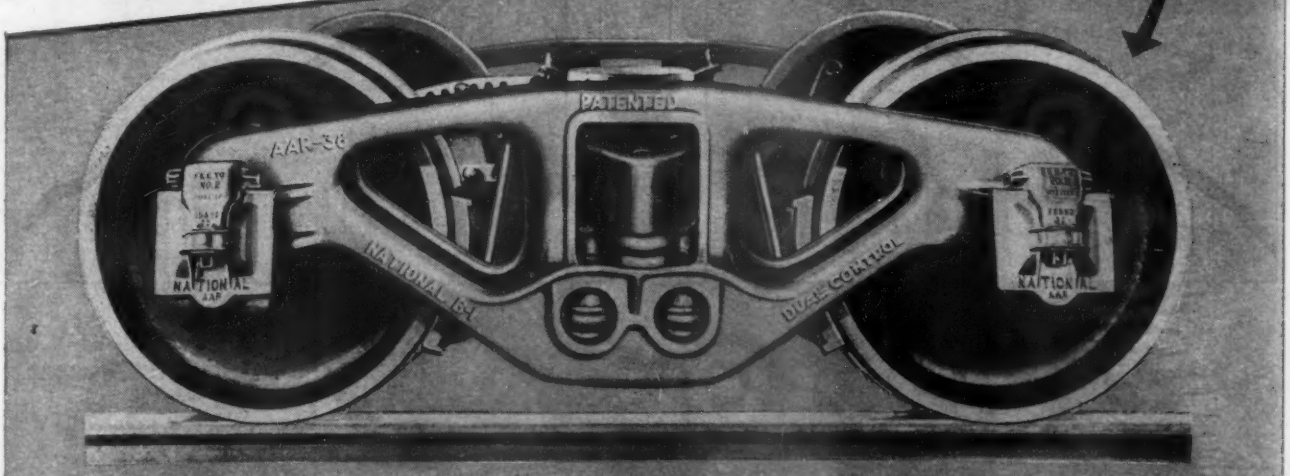
CONSTANT FRICTION CONTROL

AMERICAN STEEL FOUNDRIES

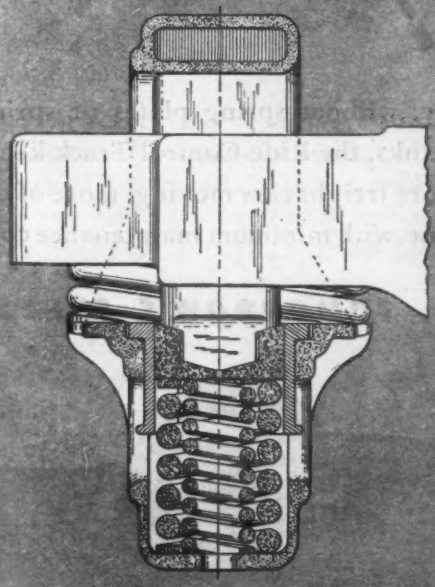
CHICAGO

MINT-MARK OF FINE CAST STEEL

The Truck For Smooth, Safe Riding



No Spring Plank
No spring plates
Quick Wheel Change



Section thru Control Unit

A smooth riding car means less damage to lading and longer life for equipment.

The National B-1 Truck has four control units (two in each side frame) which control "spring bounce" and forces which tend to throw trucks out of square.

Cars equipped with National B-1 Trucks with Dual Control can be speeded up with Safety.

Smoother riding and Fewer Parts assure lower maintenance costs.

* * *

The truck for Post-war high-speed freight service.

National B-1 with Dual Control.

Specify National B-1 Trucks with Dual Control to keep cars "on the go"

NATIONAL MALLEABLE AND STEEL CASTINGS CO.

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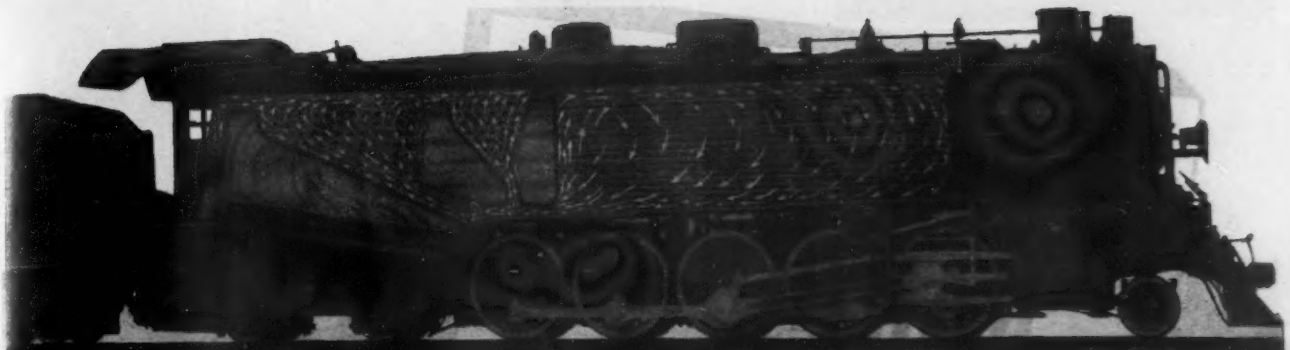


SYPHON LOCOMOTIVES ARE BETTER

24,306 SYPHONS

IN

10,118 LOCOMOTIVES

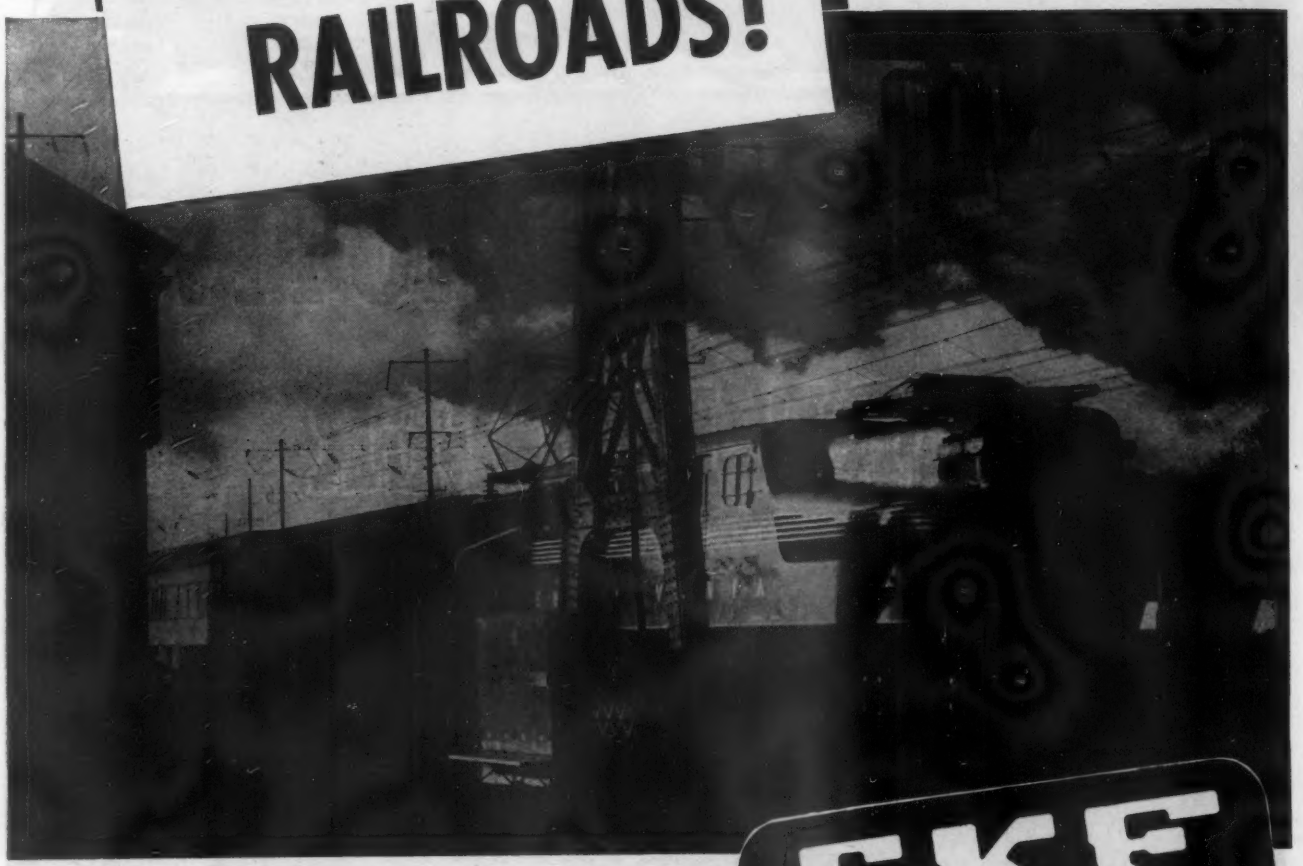
ON

190 RAILROADS

Locomotive Firebox Company

PHILADELPHIA CHICAGO MONTREAL

Thanks to RAILROADS!



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BALL AND ROLLER BEARINGS

Our sincere thanks for their patience and understanding when we can't deliver all the SKF Bearings *they* need . . . for realizing that our production is "at war". We especially appreciate this assurance that SKF Bearings will always find as warm a welcome on the railroad equipment of Peacetime as they are finding in the arsenals of war. 5765

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Dining Car Chairs

Goodform Aluminum Dining Car Chairs are used today on practically every railroad throughout the country. They are readily moved about in crowded quarters, as they are built of light weight aluminum.

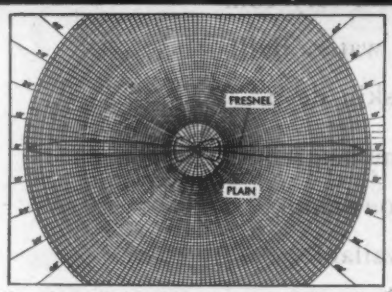
Durable metal construction gives them years of trouble free service. Their foam rubber upholstery makes them very comfortable. Cleaning is done easily with soap and water. Built by master craftsmen, their beauty is more than "skin deep".

Goodform Aluminum Dining Car Chairs are not manufactured now but when Victory is won, these chairs that are outstanding in beauty, comfort and durability, will again be available.

THE GENERAL FIREPROOFING COMPANY

YOUNGSTOWN 1, OHIO

How Corning Research Made the Night Safer



Where the Light Goes: **This photometric chart shows the vertical light distribution of type 250 clear Fresnel globe compared with plain lantern globe.**

HERE is just one example of how CORNING engineering knowledge and research in glass, applied to a signalling problem, has helped to make the night safer . . . for those who travel and for those who work on railroads.

CORNING developed the Fresnel globe . . . a lantern globe that acts like a lens, concentrating the light in a horizontal plane and giving approximately seven times the beam candlepower of a plain globe. The distance of visibility is increased about two and a half times. This extra visibility has proved exceptionally valuable—in red for signalling and in blue for protection of those working on tracks and crippled cars.

Out of CORNING laboratories have come the AAR (Signal Section) standards, covering lenses, roundels, glass slides, lantern globes, and battery jars . . . the standards that have meant so much in railway signalling progress. All manufacturers of Lamps, Lanterns and Signals can supply CORNING Railroad Glassware.

Safety depends on Signal Glassware — America's Railroads depend on Corning. Corning Glass Works, Corning, N. Y.

CORNING
means
Research in Glass

"CORNING" is a registered trade-mark and indicates manufacture by Corning Glass Works, Corning, N.Y.

FOR RESISTANCE TO FATIGUE
—no other material can equal ALLOY STEELS

Fatigue failure—insidious enemy of working parts, especially those subject to sudden reversal of stresses or those which must resist varying concentrations of stress such as the locomotive parts shown above—can best be avoided by the use of alloy steels.

For alloy steels surpass all other materials in strength—*and in the ability to maintain it under the most severe conditions.*

And that is only one reason for your use of alloy steels. Others include a uniform, predetermined response to hardening—resulting in high resistance to wear. High strength-to-weight ratios which permit reduction of sections and weight with safety. And resistance to severe strains, shock, high temperatures, sub-zero cold and corrosion which mean safety, long service life and low maintenance and replacement costs.

Republic—world's leading producer of alloy steels—offers you the benefit of its unequalled experience in the selection and fabrication of the most efficient and most economical alloy steel for each use. A Republic metallurgical engineer is ready to visit you at your convenience. Just write to—

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Also Carbon and Stainless Steels—Sheets—Plates—Pipe—Upset Bolts, Nuts and Rivets—Electric Resistance Weld Tubing

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STYLE A-6-A
HOLLAND
VOLUTE
SNUBBER SPRINGS

Overloaded Spring Groups are the "Shock Troops" of railroading. Let Holland Volute Springs absorb and cushion today's greatly-multiplied spring shocks.

★ *Uncle Sam uses Volute Springs on many tanks*

SIGNAL CORPS PHOTO

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OXWELD Supplies the Correct Rod for the Job

For These Jobs	Use These Rods	To Get These Results
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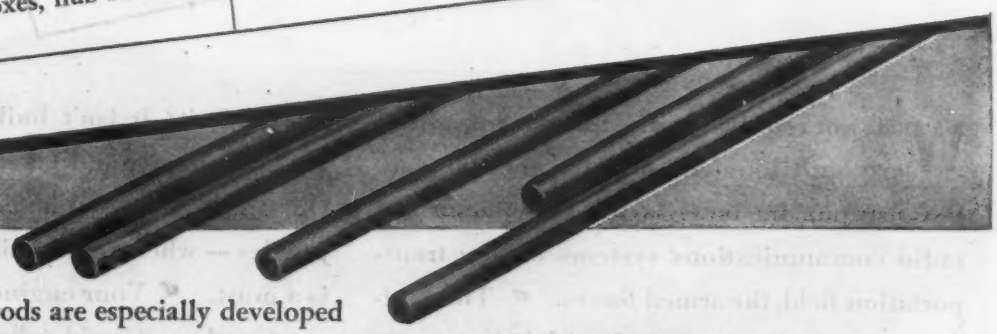
Building-up rail ends and other trackwork	MW Patented Steel Rod	Abrasion resistance High tensile strength
Signal and traction bonds	No. 19 Cupro Rod	Ductility Quick solidification
Aluminum sheet and castings	No. 23 Aluminum Rod	Rigidity High tensile strength
Cylinders and other iron or steel castings	No. 25M Patented Bronze Rod	Easy machinability Strength
Coach sides and equipment, dining-car equipment	No. 28 Columbium-Bearing Stainless Steel Rod	Corrosion resistance Ductility
Piston heads and other moving parts	No. 31T Patented Bronze Rod	Wear resistance Heat resistance
Couplers, draft gears, truck sides, piping, forgings	No. 32 CMS Patented Steel Rod	Superior tensile strength Ductility
Driving boxes, hub faces	No. 39 Bronze Rod	Wear resistance Shock resistance



OXWELD welding rods are especially developed to make the best possible repairs on railroad equipment. The many kinds and sizes of OXWELD rods allow you to select the one that will give the most satisfactory results on each job.

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THE OXWELD RAILROAD SERVICE COMPANY
Unit of Union Carbide and Carbon Corporation
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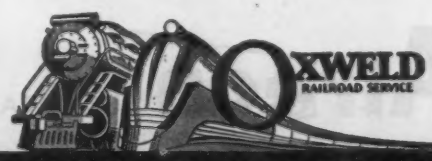

SINCE 1912 THE COMPLETE OXY-ACETYLENE SERVICE FOR AMERICAN RAILROADS

"MW" and "Oxweld" are registered trade-marks of Union Carbide and Carbon Corporation.

We sell battleships

WELL, not *real* battleships. But our products are *built* like 'em. And for good reason. Because our business is the manufacture of radio communications systems for the transportation field, the armed forces. ◂ The beating our equipment takes shouldn't happen to a dog. It pounds the rails, hits 4 G's—gets hot flashes, cold chills. But it lasts. ◂ And why shouldn't it? It isn't built for polite society. It's made to give and take. And with precision. On trains, trucks, planes; on mountains, in jungles — wherever unfailing communication is a must. ◂ Your engineers and ours should get together. They'd talk the same language. And our factories can translate their conversation into what you want.

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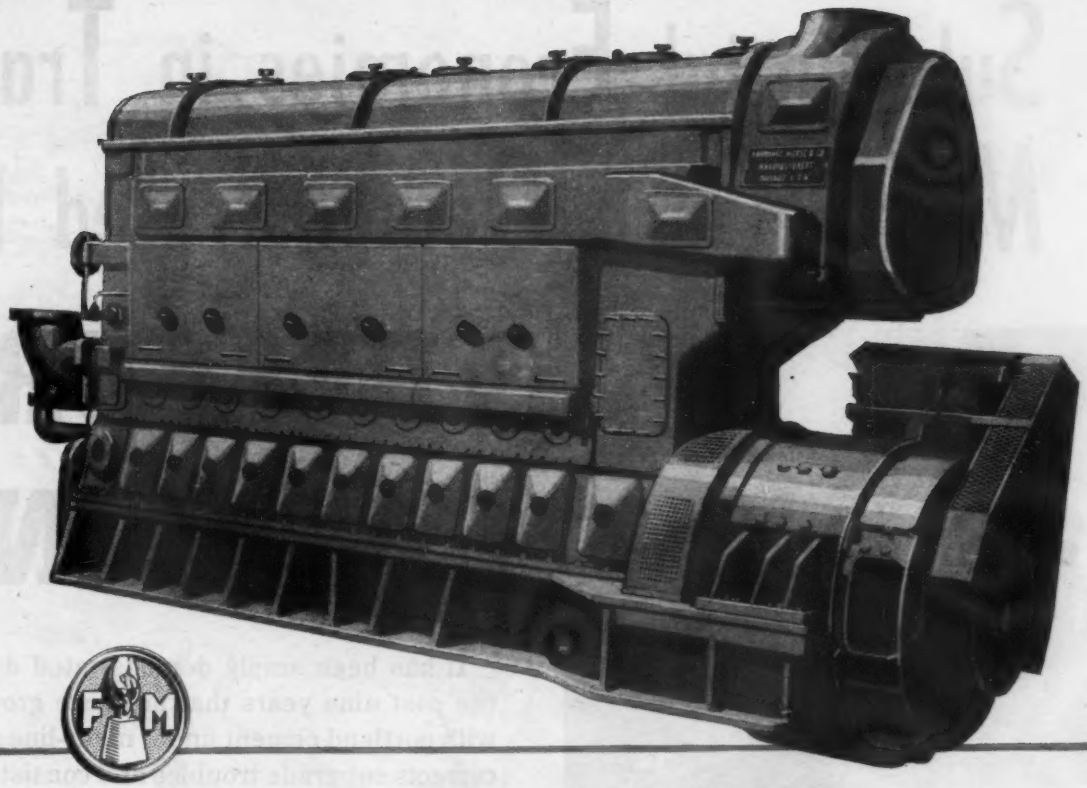


Tomorrow's **POWER** *Today!*

It's the Opposed-Piston Diesel Locomotive by

FAIRBANKS-MORSE

A name worth remembering

Substantial Economies in Track Maintenance Demonstrated by

PRESSURE GROUTING

No slow orders. Grouting gang stands aside as fast train passes pressure grouting operation on Wabash Railroad, at Grabill, Ind.

PRESSURE GROUTING

Stiffens the subgrade.
Prevents surge action of water.
Transforms water pockets into load-spreading slabs.
Helps keep tracks in line and surface.
Makes ties last longer.

It has been amply demonstrated during the past nine years that pressure grouting with portland cement under main-line track corrects subgrade troubles and consistently effects important savings in the maintenance of track.

One major railroad system which has grouted thousands of feet of track in many different locations reports that the amount saved by reduced maintenance within a few months, exceeded the entire expense of grouting.

Pressure grouting is now a standard maintenance operation on more than a score of major railroads. It requires no capital expenditure. Work may be done by foreman and small gang of track laborers with simple equipment.

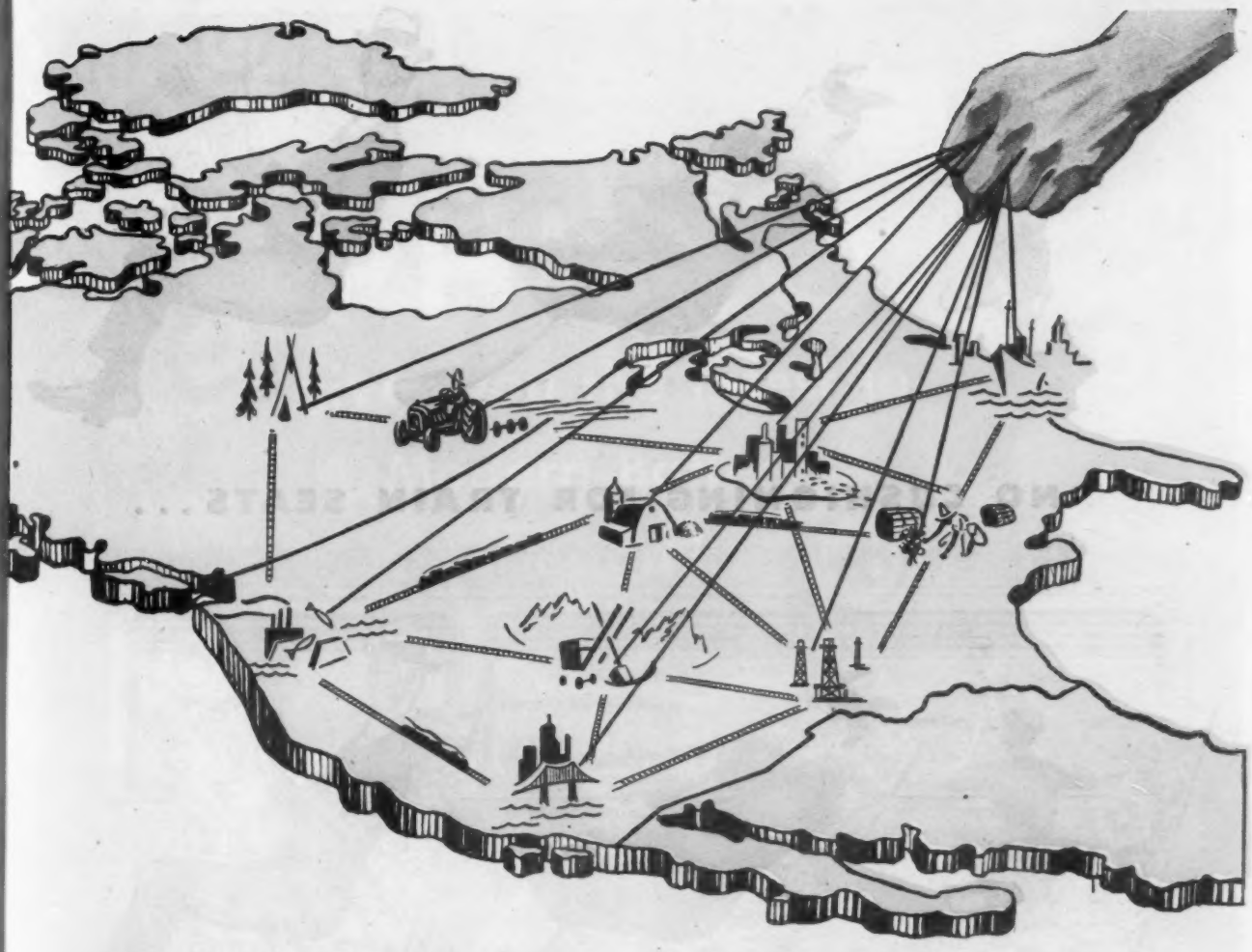
Our engineers have developed valuable experience on grouting under field conditions. Let us help you determine how grouting can solve your track maintenance problems.

PORTLAND CEMENT ASSOCIATION

Dept. A4a-26, 33 W. Grand Ave., Chicago 10, Ill.

A national organization to improve and extend the uses of concrete ...through scientific research and engineering field work

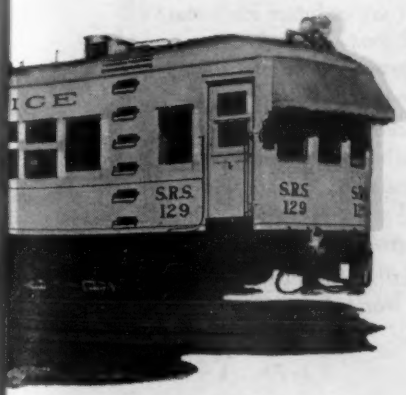
BUY AND KEEP MORE WAR BONDS



Coordinating A Continent

NEARLY three hundred thousand miles of railroad track form a great spider-web over the seven and one-half million square miles of land that is this continent. Over a million Americans earn their livelihood by serving the railroads of the country. This vast network ties a continent together—coordinates its wide-spread functions—and makes our countries an efficient unit.

American Railroads are famed the world over for their fine record of safety—and the wide-ranging Detector Cars of Sperry's famed yellow fleet are recognized as an important contributor to this safety record.

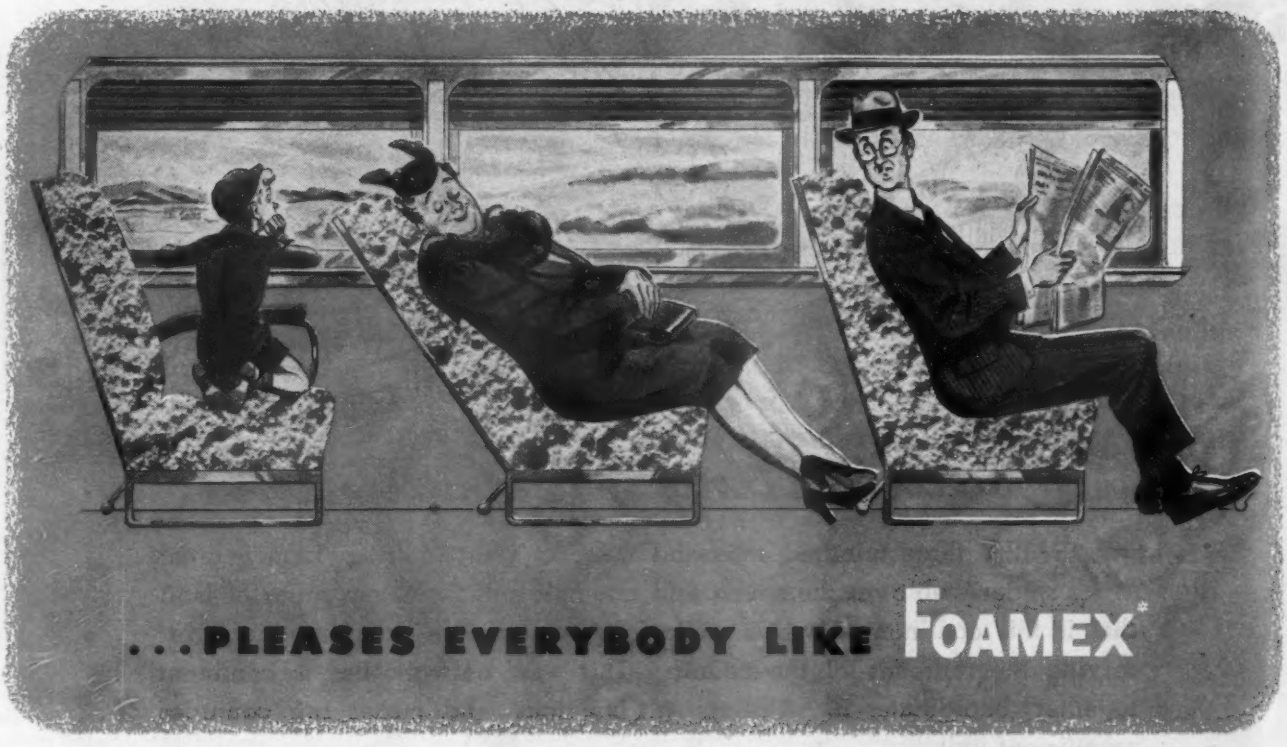


~A Sperry Contribution in Peace and War~

SPERRY
Rail Service

HOBOKEN, NEW JERSEY CHICAGO, ILLINOIS

NO CUSHIONING FOR TRAIN SEATS...



Some passengers are soft and plump.
Some passengers are spare.
But Foamex cushions every one
Luxuriously...on air.

The way *Foamex* cushioning treats folks, big or little, heavyweight or featherweight, is positively poetry.

It cradles them on millions of air-and-latex cells that make sitting feel like floating.

Those air-soft latex cells are so sensitive they mold themselves to the tenderest muscles. So buoyant, they can't pack hard under weight and cramp flesh, block circulation. And every cell breathes to air-cool passengers, and keep seating dust-free, damp-proof, odor-proof.

All this luxury pays for itself in maintenance savings. *Foamex* doesn't sag or lump. Each seat or back is *one molded unit*. Years of use on highway and railway prove *Foamex* cushions hold their shape almost indefinitely.

Our fighting men need *Foamex* even more than you do. Its unmatched cushioning power shields them from concussion. *Foamex* will be busy helping them until war ends and your big battle for passenger traffic starts again.

P.S. The ideal covering for *Foamex* seats —*Velon**, Firestone's wonder fabric. Makes smarter colors practical.

*TRADE MARK

ANOTHER CONTRIBUTION TO A BETTER WAY OF LIFE by **Firestone**

LISTEN TO THE VOICE OF FIRESTONE MONDAY EVENINGS OVER NBC

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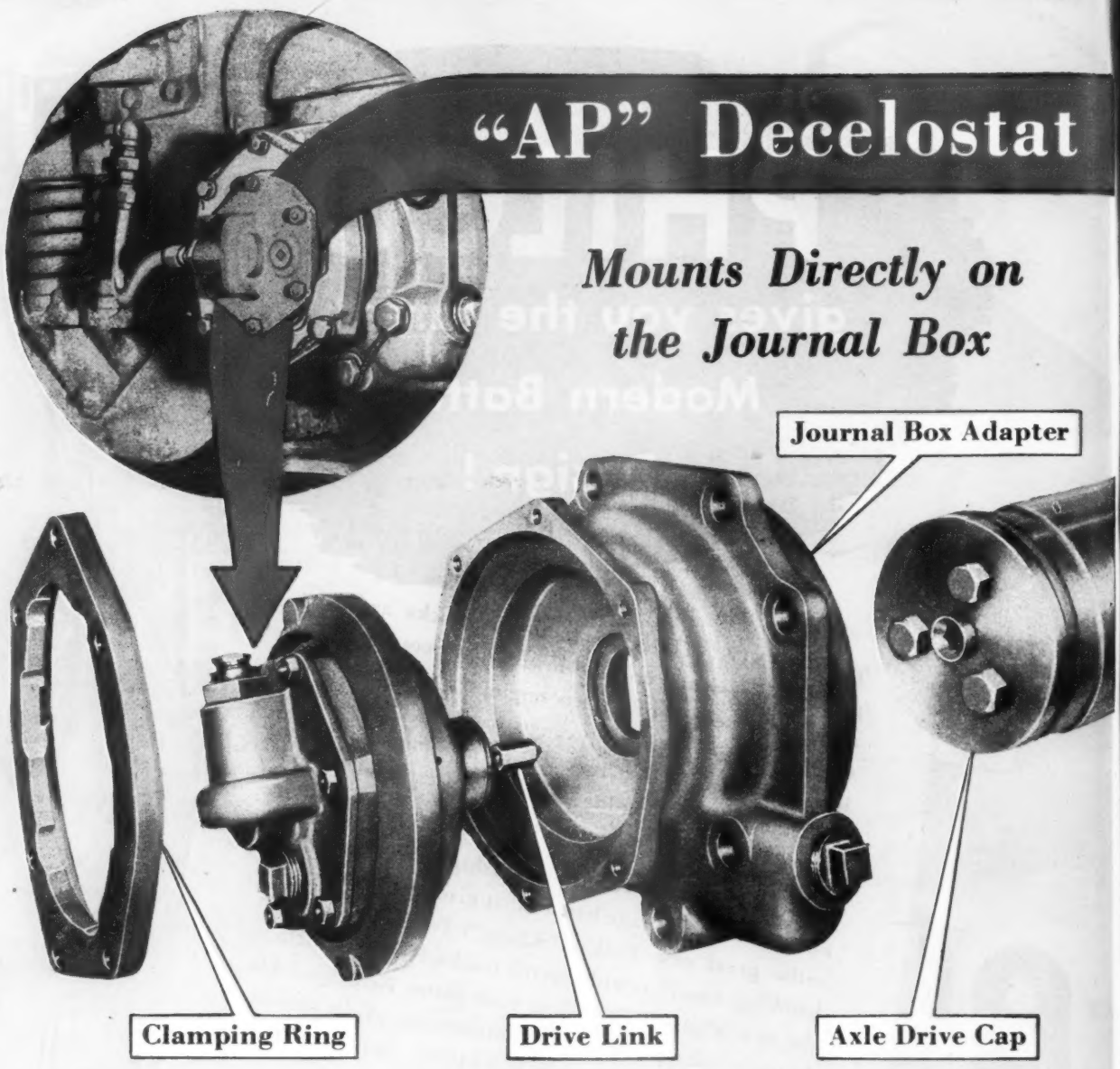
gives you the latest in
Modern Battery
Design!
THOUSANDS of electric industrial trucks are now getting more work done at lower cost because of the advanced research of Philco engineers in developing tougher, more powerful storage batteries. Philco has long led in providing batteries of maximum capacity, with the rugged long-life construction especially engineered for today's heavier work schedules.
Now Philco engineering leadership is demonstrated anew with the storage battery that gives 30% longer life —the great new Philco "Thirty"! For lower cost in handling materials with electric trucks, be sure to include the new Philco "Thirty" in your plans. Now available in preferred types. Complete information gladly sent on request. PHILCO CORPORATION, *Storage Battery Division*, Trenton 7, New Jersey.
For 50 years a leader in Industrial Storage Battery Development
The new Philco "Thirty" with 30% longer life is identified by its distinctive red connectors.

"AP" Decelostat

Mounts Directly on the Journal Box



THE "AP" Decelostat softens the brake whenever wheel retardation indicates that rail-wheel adhesion has been exceeded. It is applicable to any axle with anti-friction bearings. Mounted in a journal box adapter it is driven through a flexible drive link operated from a drive cap attached to the end of the axle.

The Decelostat is replaceable as a unit merely by removal of its clamping ring and it interchanges from axle to axle. Driven directly from the end of the axle the "AP" Mechanical Decelostat is always on the alert to detect wheel slippage during periods of retardation and operates instantly to soften the brake.

Westinghouse Air Brake Company

Wilmerding, Pa.

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ACE

at

apter

ny

AILWAY AGE

Railway Age

With which are incorporated the Railway Review, the Railroad Gazette, and the Railway Age-Gazette. Name registered in U. S. Patent Office.

Vol. 118 April 7, 1945 No. 14

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In This Issue

Page

What Type Diesel Repair Shop Facilities? **616**

Building committee of the American Railway Engineering Association considers basic needs under varying conditions and offers valuable suggestions

C. & N. W. Fiscal Progress Outstanding **620**

Tells how, in the past four years, the $110 million earned income before fixed charges has enabled this road to continue phenomenal financial feats, carry out extensive property improvements and reduce operating costs

What Your Customer Is Thinking About **627**

Here's an outline of the duties of an industrial traffic manager as presented by G. Lloyd Wilson, professor, transportation and public utilities, University of Pennsylvania

EDITORIALS

The Railways and National Defense 613
Diesel Shops 614
Development and Research Not the Same 614
What About "Freezers"? 615

GENERAL ARTICLES

What Type Diesel Repair Shop Facilities? 616
C. & N. W. Fiscal Progress Outstanding 620
Proposed Gas-Turbine Locomotive, by J. T. Rettaliata 623
What Your Customer Is Thinking About, by G. Lloyd Wilson. 627

RAILROADS-IN-WAR NEWS **631**

GENERAL NEWS **635**

FREIGHT OPERATING STATISTICS **651**

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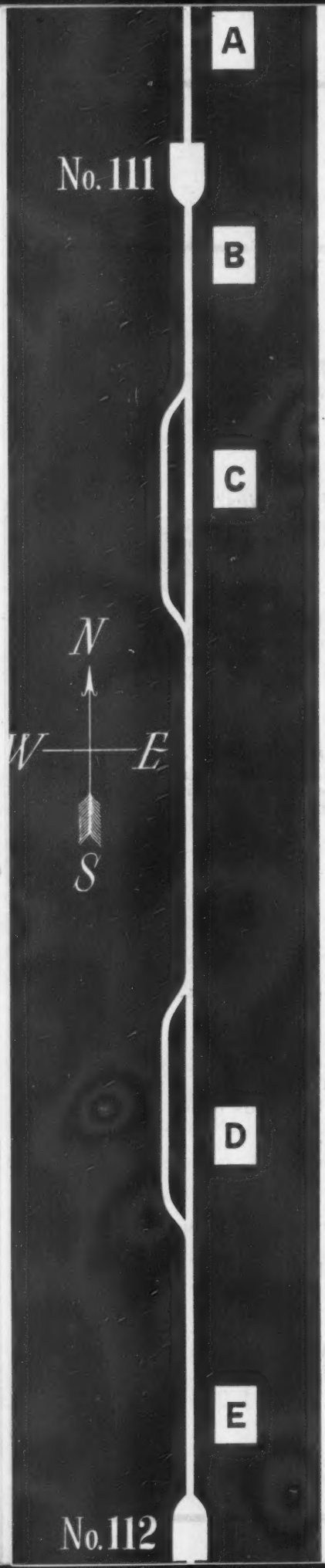

How to change a meet in a few seconds

Let's look at the situation shown in the diagram at the left.

Southbound train 111 and northbound 112 have orders to meet at D, with train 112 holding the main line. However, 111 loses time, and when it is OS'D at A, the dispatcher decides to change the meet from D to C.

Here's what happens—

A Dispatcher checks with operator at B to make sure 111 has not passed, then writes new orders, telephoning or telegraphing them to operators at B and E.

B Operator at B places train order signal in stop position, writes down orders, reads them back to dispatcher, prepares clearance form, fastens copies on hoops for engineman and for conductor. As train passes, orders are handed up to engine and caboose.

C At E, operator also places train order signal in stop position, writes down orders, reads them back to dispatcher, prepares clearance forms, and fastens copies on hoop for engineman and for conductor. As train passes, orders are handed up to engine and caboose.

D At siding C, train 111 stops; brakeman throws switch, train proceeds into siding. When it clears main track, brakeman returns switch to normal.

E Train 112 can now continue without loss of time, but after it passes siding C, switch must again be thrown, permitting 111 to re-enter main track. After 111 has cleared switch, it must stop until switch is returned to normal and brakeman is on board.

Reduced to its simplest form, that's changing a meet by written train orders. When it can be done at all, minutes are required to redirect trains to avoid still further loss of time.

With "Union" C.T.C., OS'ing is automatic; trains proceed by signal indication, and dispatcher sets signals and switches by simply flicking miniature levers. Total time to change a meet is a matter of seconds rather than minutes, and at least two train stops are avoided. Our nearest District Office will be glad to explain how simply and quickly it can be done.

UNION SWITCH & SIGNAL COMPANY

SWISSVALE PENNSYLVANIA

NEW YORK CHICAGO ST. LOUIS SAN FRANCISCO

The Week at a Glance

SHOPS FOR DIESELS: Diesel locomotives require shop facilities adapted to their peculiarities, and a steam locomotive shop lay-out, modified only by make-shift, will not give the owning railroad its money's worth from its Diesel power. The foregoing statement isn't a specious generalization but a conclusion arrived at from experience with Diesels by railroads which have plenty of it. Furthermore, these roads are giving effect to their educated opinion by making extensive alterations to steam locomotive repair installations to adapt them more closely to their new job; or are providing the new breed of iron horse with brand new stables, designed to meet the special needs of the critter. There appear to be three general types of Diesel maintenance installations—one for routine inspection and light running repairs, another for heavy overhauling, and a third combines the two others, that is, it is one which will do the running job plus as much of the heavy as is locally necessary. This big and timely subject is reported upon by an A. R. E. A. Committee whose practical advice is set forth in an article in this issue.

●

WALLACE ELECTIONEERS: The wily and ambitious Secretary of Commerce appeared at a meeting of the Railway Labor Executives Association last week and gave the boys a little talk on the program for post-war employment which he derived from Lord Keynes and the C. I. O. The account of the session in "Labor" suggests that the executives were quite aflutter at this attention from the official whose utterances indicate that, if he could, he would gladly abolish the industry from which their livelihood is derived. Henry may cherish the hope that he can emulate other vote-seekers before him who have shown it to be politically possible to accomplish the logical absurdity of being a "friend" to railroad labor while striving to obliterate the revenues from which their pay is drawn.

●

LOADINGS ESTIMATE: Carloadings in the second quarter will run about the same level as last year, according to Shippers' Advisory Board estimates reported in our news pages. Of the 13 regional boards, seven predict increases, ranging from less than one per cent (Central Western) up to about 10 per cent (Northwest). Of the six boards foreseeing decreases, the largest (6 per cent) is predicted for the Southwest.

●

RESEARCH OR DEVELOPMENT?: Much of the disagreement among those who discuss "railroad research" arises from lack of precision in terms. An editorial herein suggests that one of the major problems in the choice of motive power lies, not primarily in the field of research, but in that of "the economics of locomotive utilization"—that is, not in further improvements to locomotives but in finding the type among those already available which is actually best fitted to a given job, and then handling that type in a manner to maximize its advantages. A further step in the improvement of motive power consists in development, that is, not innovation but adapting to railroad use devices already found practicable elsewhere. The Diesel locomotive, it is pointed out, is the product of such development—consisting of the combination of the Diesel motor with the time-tried electric locomotive. Research to reveal new means of getting at the power stored up in fuel stands, of course, at the apex of the process—but it accomplishes nothing of practical value in the absence of homely and near-at-hand efforts at utilization and development. Grand projects of possible value a decade hence deserve attention, but more zealous and intelligent interest in the chores will be helpful, too.

●

NORTH WESTERN'S COMEBACK: The Chicago & North Western this week sold $54,000,000 of 44-year first mortgage bonds at an interest cost of only a hair above 3 per cent, and an article herein sketches the remarkable progress this company is continuing to make in adding to the firmness of its financial structure—after the I. C. C. in the reorganization had already reduced its annual fixed interest requirements by more than 75 per cent. The reorganized company has carried on by debt reduction and refinancing to lower its wrung-out interest requirements by another 48 per cent. Prior to reorganization, the North Western's total fixed charges were $16 million; immediately after reorganization they were $4 million; now they are $2 million.

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GAS-TURBINE LOCO: The theoretical advantages of the gas turbine as a source of railway motive power, together with specific proposals regarding the design of such a locomotive, are given in this issue in a paper by an Allis-Chalmers engineer. The author's suggestions embody electric drive but he believes that a hydromechanical transmission would do the job satisfactorily, with savings in weight and in increased efficiency.

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RAILROADS FOR WARFARE: How far off would victory over this nation's enemies be today if its railroads were producing only the amount of transportation they produced in 1940? The nation's total traffic has risen over 400 billion ton-miles to an annual total of over one trillion ton-miles and the railroads are caring for 88 per cent of the total increase. In the period between the two wars billions of "federal aid" went into highways, one excuse for the outlays being the promotion of "national defense"—but, when the crisis came, production of long-haul transportation by highway didn't increase; instead, it receded. An editorial herein suggests that railroads and local trucks have an *inherent* excess of capacity in peace time which can be made available in a time of crisis in a manner impossible to heavy-duty, long-haul trucking. It is probably demonstrable that government outlays for long-haul highway development have actually reduced the nation's war-time transportation capacity.

NON-ESSENTIALS FIRST: In the April issue of "Domestic Commerce," a Department of Commerce publication, Assistant Commerce Secretary Burden ballyhoos federal planning and appropriations for airport construction for civil aviation —unmindful of the fact that, if people want to fly, profit-seeking private enterprise will provide the facilities for them; that is, if private investment is not scared away, as it now is, by the prospect of government competition. Meantime, no official foresight is expended on the likelihood that there may be fewer railway facilities that the country needs for its next great effort at arms, if, as is now planned, the railroads' peace-time traffic is going to be further siphoned off by promotional billions expended upon transportation plant which experience has shown is unproductive in war-time.

●

IMPROVIDENCE: Small-town common sense used to have an expression to describe the housewife who neglected the upkeep of her dwelling and the nourishment of her children while she spent her time and her husband's pay at the dressmaker's and the milliner's. Of such a woman the neighbors used to say, "She puts it all on her back." And does not that observation aptly characterize the way this nation has been treating its transportation ever since the last war—with present preparations to elevate the spending orgy to a new high level as soon as peace comes? It certainly isn't in the railroads' interest that they should continue to keep silent at such a prospect. It isn't in the country's interest either. The recent A. A. R. opinion poll showed that the public doesn't know the facts of this situation, and it won't learn them from railroad silence.

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INDUSTRIAL TRAFFIC JOB: The most successful salesman is usually the one who knows most thoroughly what his prospective customer's needs are, and proceeds intelligently to help him meet them, often but only incidentally by the use of the product the salesman has to sell. If this observation be true, then the duties and concerns of the industrial traffic manager—the railroads' principal customer—should be a profitable subject for attentive study by all railroad men. The invitation and the means to such inquiry are offered in an article herein by one of the traffic profession's leading exponents, Dr. G. Lloyd Wilson of the University of Pennsylvania, who outlines the responsibilities of the industrial traffic manager, with a suggestion implicit in almost every paragraph of opportunities for the alert salesman of railroad service to prove helpful.

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DOWNWARD NET TREND: Net railway operating income in the first two months of 1945 was down 15 per cent from last year; net income fell off 18 per cent. Gross revenues were 3 per cent lower than in the first two months of 1944, while operating expenses were a shade under 2 per cent higher. Details are given in our news pages.

IT'S A GREAT NEW DAY FOR RAILROADING

THE POWER GOES ROUND AND ROUND

A General Motors Diesel locomotive applies traction power by rotation instead of by reciprocating movement. Hence there is less hammer-blow to the track; less wear and tear on draft gears owing to smoother starts and stops.

In brief—greater economy and safety.

ON TO FINAL VICTORY
BUY MORE WAR BONDS

GENERAL MOTORS
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ELECTRO-MOTIVE DIVISION
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RAILWAY AGE

The Railways and National Defense

Whether or not the prospects for future earnings by the railroads are sufficient to induce continuing large-scale investments of private capital in the improvement of their fixed properties, the evidence is plain that considerations of national defense alone require that such capital expenditures be made, regardless of the source of the funds. In last week's *Railway Age* it was shown that of the increase of 408 billion ton-miles which the war brought (1940 to 1943) to all agencies of transportation, the railroads moved 358 billion ton-miles, or 88 per cent of the total increase.

All agencies of domestic transportation are being pressed to the utmost, but only the railroads have shown the ability to assume an increased load of sufficient proportions to make possible a war effort of the present magnitude by this country. Where, for example, would the nation's fighting machine be today if the railroads had not been able to assume a greater traffic burden than that which they were given in 1940? In that event, domestic transportation in 1943 and 1944, instead of having averaged over a trillion ton-miles, would have been only two-thirds as much—far too little, certainly, to have brought us so far along the road to victory in two wars.

Outlays Which Have Hindered Defense

In the period between the two great conflicts, the federal government poured out billions in "federal aid" to highways, one justification for these outlays being that they would contribute to national defense. When war actually came, however, the production of the highway system in both ton-miles and passenger-miles declined instead of increasing, throwing traffic upon the railroads which they would have had more facilities to accomodate but for the losses of revenues they suffered because of diversion of traffic to the federal-aid highway system in peace-time. It could probably be demonstrated that federal aid to highway construction (especially that devoted to long-haul highways of the "super" class) actually, because of its retarding effect on railroad earnings and improvements in peace-time, has actually diminished the country's war-time supply of transportation rather than increased it; and, hence, that such outlays, instead of promoting national defense, have proved a hindrance to it.

The ability of the railroads to assume so large a share of the increased volume of transportation generated by the war has its origin in inherent characteristics of railroads which are not often considered. Chief among these is the fact that railroads, being relatively few in number, can and do operate as a single system under conditions of emergency, so that, for example, cars are sent where and when they are needed, regardless of the special interests of their individual owners. Competitive conditions do not favor such "regimentation" of equipment in peace-time, and cars are then dealt with more leisurely—allowing a wide margin of "slack" from which the necessities of a military crisis can profit by acquiring enlarged transport capacity without attendant increase in the number of vehicles. Trucks in widely scattered ownership cannot be thus brought under central control in war-time and, even if they could be, no such surplus capacity would be discovered in them, because these vehicles, being much more costly in relation to capacity than freight cars, are more intensively used in peace-time.

There are other reasons inherent in the railroad form of transportation which make it possible to extract from it a maximum of performance in time of pressing necessity—one being the close managerial control which is exercised over each segment of track. With highway transportation, the lack of centralized authority over traffic results in the "bunching" of vehicles at certain hours of the day. Hardly any highway is used to capacity for more than a few hours out of the twenty-four, while the control of movement on many important stretches of railroad extracts the maximum ton-mile output of which it is capable every hour of the day. The famous "Red Ball" highway operated by the army in France after D-day, before the French railways had been restored, simulated this railroad method of securing maximum utilization—operating vehicles in one direction only, at uniform speed, in "convoys" with a "conductor" in charge. Probably no highway was ever before called upon to work so steadily so many hours a day—and yet the army abandoned this operation in favor of railroad movement just as soon as repairs to the railroads made the change possible.

Railroads Indispensable to Large-Scale Warfare

In the field of the short haul, highway transportation has no rival, but for long hauls it has little to offer to a national defense program, because long-haul trucks are operated close to their maximum capacity in peace-time. Only local farm and delivery trucks have important spare capacity, such as the railways have, and upon which the nation can rely in time of need.

The kind of service which only railroads can pro-

vide is an indispensable component of large-scale warfare, which must conserve labor and materials because its demands for both press hard upon the national supply. This fact needs elucidation to the American people—not in general and rhetorical terms but supported by specific evidence of which a large variety is available. Railroad men should make it known why preparation against further hostilities does not stop with a lot of military training, a lot of ships and a lot of plane-building capacity alone but must also include the keeping in full vigor of the only means of transportation which can unite all of America's productive power into an invincible weapon of defense and offense.

Diesel Shops

The A. R. E. A. has rendered useful service to the railways in the report of its Building Committee on the Design of Shop Facilities for Diesel Locomotives. Because of the importance of this subject to railway managements, who should be informed of the need for such facilities, and to engineering and mechanical department officers, who must build and operate them, the report is presented in this issue practically in its entirety.

Based on the experience of a number of railways and the recommendations of Diesel locomotive builders, the report first sets forth the three general types into which Diesel-electric locomotive shops are logically divided, and the factors which influence the type and extent of the facilities to be provided at any particular point.

Then, analyzing each type of shop, it discusses the various factors of its design, such as its general arrangement, track layout, floors, pits, platforms, hoisting equipment, auxiliary shops, storeroom, etc., all in the interest of the highest class of work, the greatest speed and efficiency in carrying out that work, and the lowest possible maintenance costs. On the basis of this information alone, the committee's findings are an important contribution to a development still largely in its early stages, but they will fall far short of their full value if, in addition, they do not first stimulate among higher railway officers full appreciation of the need for such facilities.

Sight can never be lost of the higher initial cost, of Diesel-electric locomotives, which, in itself, justifies the investment necessary in shop facilities to protect this greater initial outlay. Furthermore, with Diesels, the railways are dealing with machines of high precision, with extensive, if not delicate and complicated electrical auxiliaries, which require a degree of cleanliness and refinement in maintenance not necessary or common in steam locomotives. Still further, with the high availability of Diesel locomotives being so largely dependent upon their adequate and effective upkeep in a minimum of shopping time, it is evident that lack of the necessary, properly located, and properly designed and equipped facilities to this end, can help offset, if not defeat, the basic advantage of the availability of this type of power. Indeed, from many standpoints, the acquisition of Diesel-electric power calls for an entirely new concept in shop facilities if not also in methods of equipment maintenance and repair.

As pointed out in the report, the character and extent of the Diesel shop facilities necessary on any particular road will depend upon a number of basic factors, but having determined the character and extent of the facilities required, there are other equally basic factors common to all Diesel shops that are fundamental to the full realization of the possibilities in Diesel power. These considerations may call for entirely new shop facilities, and a number of roads have already found such new facilities desirable, but they do not necessarily preclude the employment of existing steam locomotive facilities, in whole or in part, if they meet or can be made to meet requirements. An article in next week's issue will describe the effective adaptation of a section of a 15-stall enginehouse for the inspection and running maintenance of road freight Diesels on the Atlantic Coast Line at Waycross, Ga. The important question is not whether new or old facilities shall be used but whether entirely adequate facilities shall be provided.

Development and Research Not the Same

There has been considerable discussion of research in the railroad field in the course of which many points have been clarified. There is one point upon which there is universal agreement and that is that research, as an idea, is worth while; the manner of application and the problems to which it should be applied are factors that give rise to divergence of opinion.

The greatest need of the railroads in the years to come is to know in just what direction to proceed. Obviously any change in the character of railroading that results in the industry's being more successful must come from within and no worth-while change can be expected until some experienced person or group recognizes the need for change and forces it by virtue of the exercise of leadership.

Take the matter of motive power for instance. There is an age-old argument as to which is the best form of motive power to use—steam, Diesel or electric. The answer to that question is not so much a matter of research as of the economics of locomotive utilization. Almost any group of impartial and qualified transportation engineers can produce evidence supporting the use of all three types, each in its proper place.

Real progress is made by development and test, usually by the application of thoroughly practical and tested ideas to accomplish a major purpose. Back of the practical ideas may, however, be years of research. The present successful Diesel locomotive, or even the more recent steam-turbine locomotive are excellent examples of this. The Diesel is, after all, but the application of a thoroughly practical prime mover to a time-tried and service-tested electric locomotive. The steam turbine locomotive is but the application of a thoroughly practical turbine development to a new use. Now, several roads are joining in the development of a steam generating unit in conjunction with the turbine looking toward a locomotive

which, when completed, will represent a new combination of tested ideas. Back of all these ideas are years of intensive research on the part of several manufacturers.

Any progressive group of manufacturers with an idea is always looking for a group of progressive railroads which will work with them to develop new products. From a business standpoint, however, it is unreasonable to expect manufacturers to embark on expensive development programs until they see some reasonable prospect that they will get some of the expenditure back in future markets. Behind most of these developments there may have been many years of research, financed either by the manufacturer or possibly in part by the railroads.

It may be pertinent to call attention to a present handicap to progress. Some roads, as a matter of policy, seem to go to extremes to keep manufacturers from finding out what they want because they do not want to be bothered by sales representatives. Any road whose engineering, mechanical or purchasing department is too busy to be "bothered" by the sales or technical representatives of the manufacturers who can supply it is pretty well-insulated against improvement.

What About "Freezers"?

The howls of anguish from shippers of perishables about spasmodic shortages of refrigerator cars should, of course, be heeded by the railways. Every effort should be made to ameliorate such shortages, but the thought is inescapable that the shippers are to blame for them. Nowhere else were such enthusiastic adherents of highway trucks and coastal steamers to be found as among fruit and vegetable shippers. Trucks went into Florida ports for movement north by ship. The shippers of the Lower Rio Grande Valley enthusiastically supported the building of a ship channel to Brownsville, Texas, at huge expense to the taxpayers, and also clamored for more and more highways. Even in the Far West, ships were becoming a competitive factor of importance. Gypsy truckers were encouraged, although the handling of perishables by highway and the indiscriminate dumping of produce at unpredictable markets were having an extremely bad effect on attempts at price stabilization. When the market went down, even though it was the result of their own shortsightedness, perishable shippers flocked to the railways, demanding concessions in the form of rate reductions, greater diversion privileges and other favors.

They used the competitors of the railways as a club to enforce such concessions, forgetting or ignoring the fact that it was the railways—not trucks or ships—which originally opened vast and fertile areas to fruit and vegetable growing. Then the war came, and competitors of the railways failed to render any service at all, or rendered such scant service as to be of no value.

As usual in an emergency, the railways were called upon to take over and, despite shortages of freezers here and there, they have come to the rescue of shippers of perishables in splendid style. Ships ceased to handle perishables entirely, while truck service rapidly dwindled.

In the Lower Rio Grande Valley some 65 per cent of the citrus crop was normally handled by truck, whereas this season less than 15 per cent of this harvest will be so handled.

Undoubtedly the railways will continue to do everything in their power to meet the demands of the shippers. This should be done, however, for the benefit of the nation at war and needing foodstuffs as never before, rather than for a class of shippers who are notoriously ungrateful and who will undoubtedly prove, as in the past, to have extremely short memories. It is to be hoped also that, where necessary, extensions will be made of Colonel Johnson's curt but essential order prohibiting the diversion of perishables at Potomac Yard. The shippers of perishables would have blocked that vital terminal except for Colonel Johnson's prompt and effective order.

Making a Tough Job Tougher

What Type Diesel Repair Shop Facilities?

Building committee of the American Railway Engineering Association considers basic needs under varying conditions and offers many valuable suggestions*

THERE have been many developments in shop facilities for Diesel-electric locomotives since the first such locomotives were put in service on the railways in 1934, and particularly during the last two or three years with the growing adaptation of Diesel power in multiple units to road freight and passenger locomotives. Until recent years, as each road began to purchase Diesel-electric power for road or switching service, the requirements with regard to shop facilities were fulfilled by the adaptation of existing steam locomotive facilities—shop, enginehouses, or other buildings—and a number of roads have attempted to carry out inspection and routine maintenance work in the open over specially constructed inspection pits, or simulated pits produced by raising the track rails up on continuous longitudinal timbers.

A Natural Development

These often makeshift facilities were a natural development while the number of Diesel units on any one road was limited, while their runs or assignments were experimental, and while the field of Diesel application in general was full of so many uncertainties—or possibilities. That attention was turned first to the utilization of existing locomotive repair shops was a natural consequence also of the depression period, when few roads were in a position to make sizeable expenditures for any but the most necessary improvements, and especially at a time when both passenger and freight traffic were such that many roads had ample steam locomotive inspection and repair facilities to turn over to the maintenance of the limited number of Diesel units then being acquired.

Not all of the early facilities provided for Diesel locomotive maintenance were poorly adapted for the classes of work required, or at least not subject to proper adaptation to these classes of work, and it is to be expected that many roads in the future can, to advantage, make use of existing steam locomotive repair shops, in whole or in part, as they become available, for both routine maintenance and heavy repairs. However, in the light of experience in Diesel locomotive maintenance thus far, it appears that most existing building facilities on the railways can be utilized effectively in Diesel inspection, maintenance and repair work, with maximum efficiency and economy in such work, only if they are modified in design and equipment as may be necessary to this end. To attempt to employ such facilities, without those changes necessary to the entirely different classes of work involved in Diesel locomotive maintenance and repair, is certain to help defeat one of the basic advantages in Diesel power—maximum availability—through wasted shopping hours, while at the same time increasing maintenance and repair labor cost.

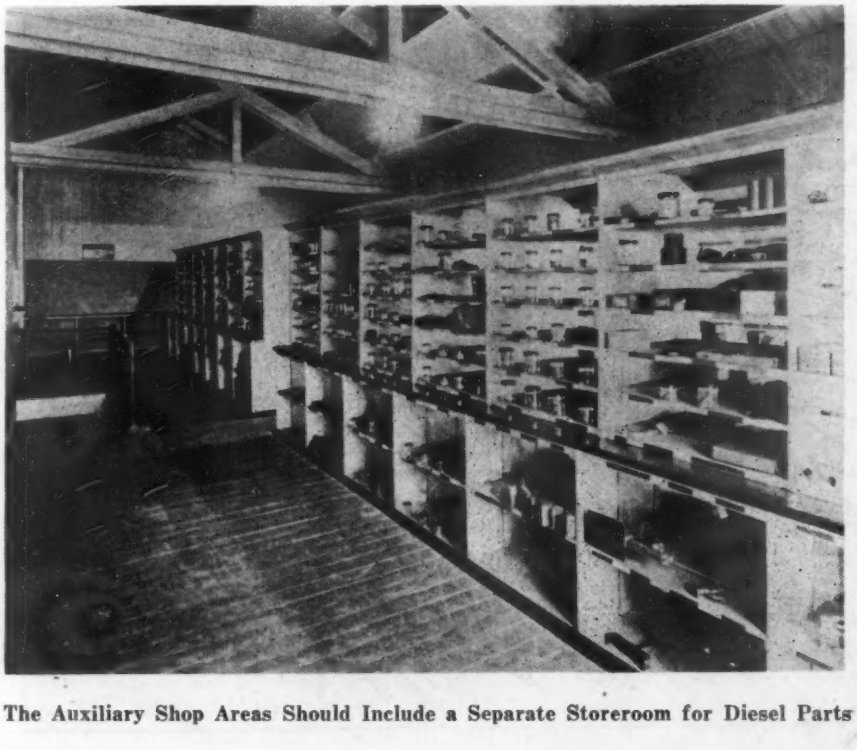
Depends on Many Factors

In spite of the extent to which existing steam locomotive facilities will continue to be employed for Diesel shop work, there is today a distinct trend toward the provision of entirely new facilities for such work. In fact, at the time this report is being prepared, new facilities are planned or are under construction on a considerable number of roads. This trend has been given impetus on some roads by the unavailability of working space in existing locomotive repair facilities, many of which have been overcrowded with steam power work since the onset of the war, but it has its basis primarily in a better understanding of Diesel locomotive operating, maintenance and repair requirements, and a desire to meet these requirements most expeditiously and efficiently, especially where any considerable number of locomotive units are involved or are contemplated. It has been influenced also by the increasing use of multiple-unit Diesel locomotives in road freight service, which are too long to house in most existing enginehouses and in many existing shop buildings.

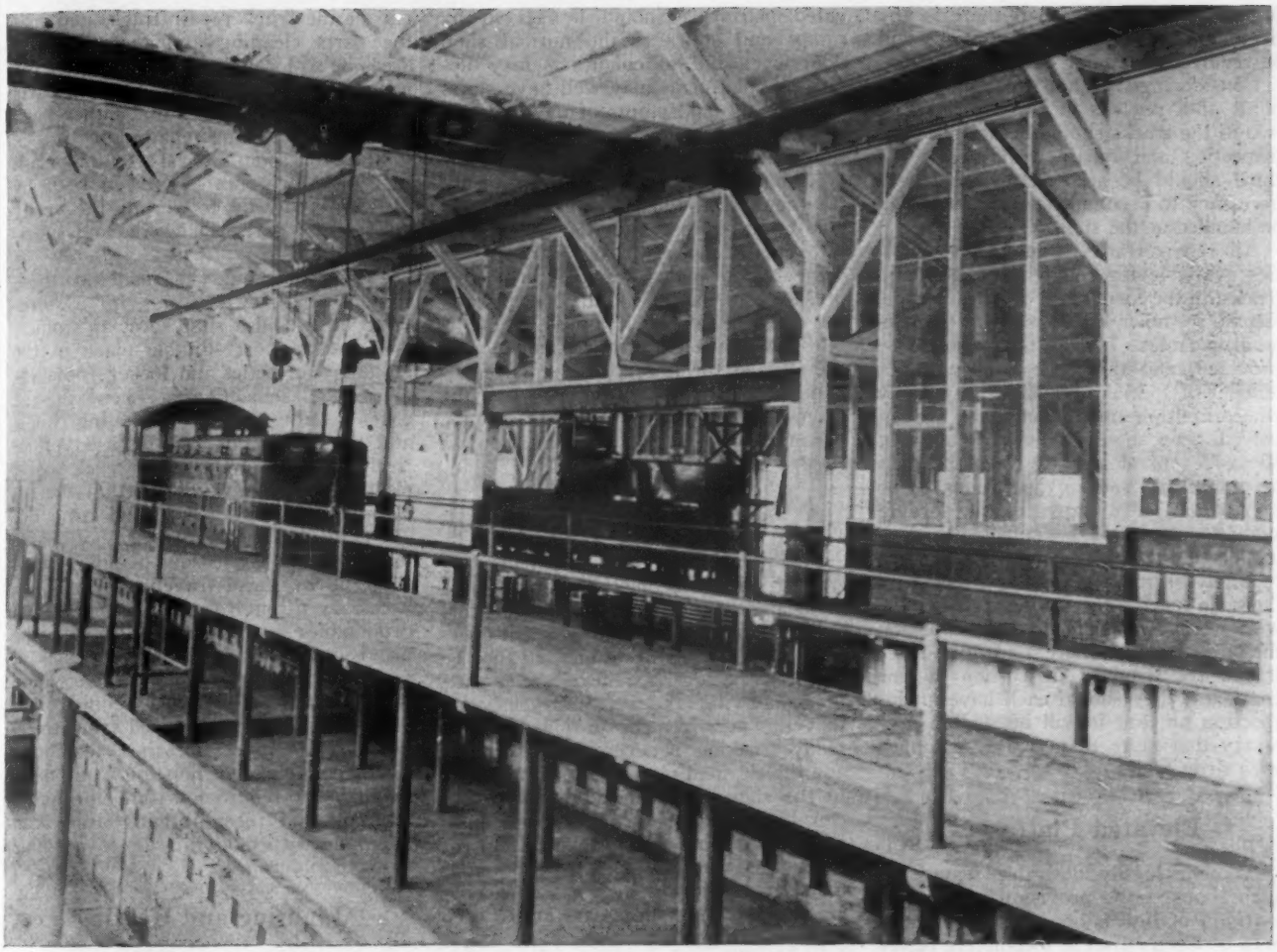
The extent and type of Diesel shop facilities required on any road depends upon many factors, including the number of Diesel units involved; operating conditions and schedules of the road or territory where they are to be employed; the road's policy in carrying out the repairs, which may be influenced by its proximity to the services and facilities of the manufacturers; the road's policy with respect to making general repairs—whether on a progressive (distributed) basis, or a periodic basis; and the availability of existing locomotive shop facilities. These factors may also have an important bearing upon the character and extent of shop tools and other equipment provided.

Fundamentally, Diesel-electric locomotive shops divide themselves into three general types. One of these types is for

* A report prepared by a sub-committee, of which Neal D. Howard, engineering editor, *Railway Age*, was chairman, and submitted to the association in March, as information.



The Auxiliary Shop Areas Should Include a Separate Storeroom for Diesel Parts



Engine-Deck-Level Working Platforms, Depressed Floors and Inspection Pits Should Serve Those Tracks Intended for Inspection and Routine Maintenance

carrying out regular inspection and routine running maintenance, which includes Interstate Commerce Commission monthly and annual inspections, and routine replacements and repairs, including wheel and truck changes, due to use, wear or failures in service operations. A second type of shop is that designed for heavy maintenance and general repair operations, including the overhauling of engine units; the repair and overhauling of generators and traction motors to the extent dictated by the policy of the road; and wheel, truck, body and frame work as required. The third type of Diesel shop is, in effect, a combination of the two already mentioned, incorporating the features of both for routine inspection, maintenance and heavy repairs to the extent dictated by policies and requirements. In other words, the third type of shop is merely an extension of the first type mentioned, with the necessary additional facilities to permit the heavier classes of work called for. Compared with an installation of the first and second types of shops located at a distance from each other, the third class, where it can be utilized to advantage, will require somewhat less equipment and auxiliary shop areas to handle the same volume and scope of work.

Shops for the inspection and routine maintenance of Diesel locomotives should, in general, be of the transverse type. The building itself may be of any substantial type of construction, with ample headroom, with large window areas to afford maximum well-diffused, non-glaring daylighting, and capable of being maintained to a high standard of cleanliness and general appearance. In all cases, the building should be served by a service track and should be afforded ready access by trucks and other highway vehicles for the delivery of parts and other supplies.

Running Maintenance Shop

Within the building certain features are essential to efficient maintenance operations and working conditions, including suitable inspection pits; the proper relation of the track level to the floor level; elevated working platforms; means of removing wheels and trucks; a parts cleaning room and a parts reconditioning room in proper relation to each other, to a storeroom, and to the elevated working platforms; a suitable exhaust system for engine gases; and provision for adequate heating and artificial illumination.

The shop building, if to handle present-day four-unit freight locomotives, should be approximately 220 ft. deep. Its width should be based upon the number of maintenance or repair tracks to be incorporated, allowing adequate working room between the centers of such tracks (some roads are allowing for platforms as much as 23 ft. wide), with adequate working room also between each outside track and the building wall faces.

All tracks, the number of which should depend upon the number of locomotives to be maintained, should be served by continuous, well-drained concrete inspection and working pits, with a minimum depth of 4 ft. below top of rail. Some mechanical officers prefer deeper pits than others, feeling that it is preferable to employ boxes and staging in such pits to carry out the operations called for, rather than that the workman in the shop be cramped continuously when moving through the pits.

The general floor level between adjacent pits should be depressed 30 in. below the top of rail, a feature designed to facilitate the inspection of and work on locomotive trucks and brake riggings. All of the depressed floor area should be of concrete, or of wood blocks or other suitable material on a concrete base. Regardless of the number of pit tracks provided initially in the shop, the ground layout and wall construction along one side should be arranged to

permit future expansion if there is any likelihood that additional pit tracks will be required at a later date.

Considering the shop from the standpoint of a nucleus of three pit tracks, two of the tracks should be designed for inspection and repair work, while the third should be stubbed at the length necessary to accommodate the trucks to be handled at the shop.

All repair tracks should have facilities available for removing wheels and trucks, in the form of an overhead crane, locomotive hoist, high-speed power jacks or drop tables. If drop tables are to be provided, and this type facility has a number of special advantages, especially where multiple-unit locomotives are involved, they should have a capacity of 50 to 75 tons, depending upon the class of power and specific operations to be carried out. The transverse pit serving such tables should be sufficiently deep to permit the table serving the outside repair track in the shop to pass beneath the table serving the second repair track, without interfering with operations on the latter track. Where more than three tracks are required in a shop of this character, they should each have an inspection pit, but it will be seldom necessary that more than two be equipped with drop tables.

Elevated Platforms

Another highly desirable feature in such shops is the provision of elevated working platforms occupying the entire area between adjacent locomotive repair tracks, and also along the outer sides of outside repair tracks, regardless of the number of these tracks. These platforms should be at engine floor level, with their outer edges in all cases 5½ ft. from the center lines of the adjacent tracks, and should be of such deck construction as to provide 6 ft. under clearance above the depressed general floor level beneath them.

The platforms may be constructed of wood, concrete, bridge-deck steel grating or other suitable material, the grating having the advantage of shallow construction and of permitting added daylighting and ventilation to the area beneath. Where grating is used, consideration should be given to providing a protecting screen beneath it to assure protection from falling tools to men working on the lower level. All of the platforms should be suitable for the trucking of parts, and some roads are finding it advantageous to equip them with a series of work benches, usually placed opposite the cab door of each locomotive unit.

To permit ready access to the sides of locomotives for truck inspection and repair work, the elevated platforms should be supported on columns at wide centers, set back approximately 5½ ft. from the near track rail. Furthermore, in the interest of freedom of movement beneath the platforms, these columns should be as small in cross section as possible.

At the front of the building the elevated platforms should be served by ramps and stairs to the normal shop floor level, and, as conditions may dictate, the platforms may well have stairs at about the mid points of their lengths to facilitate movement between the two shop levels. Furthermore, it may be desirable in some instances to install trap doors in the platform floors at suitable intervals to permit the hoisting or lowering of heavy parts. Where trap doors are provided, suitable protective precautions should be furnished when the doors are open. Likewise, to facilitate the movement of workmen across the shop at the lower level, it is of advantage to have subways across the shop, through the different track pits, preferably at a point near the drop pit if such facility is provided.

Other Facilities

Facilities for cleaning, repairing and storing Diesel locomotive parts should be located at the rear of the shop track area and, in the interest of efficient operations, it is highly desirable that they be at the same level as the elevated platforms serving the repair tracks, and that the arrangement provided permit ready trucking between these facilities and the elevated platforms. If the tracks in the shop are stubbed, the platforms can be continuous around their ends, and thus permit such trucking. On the other hand, if the tracks are continuous through the shop, some form of removable bridge will be necessary across each track at the platform level. Likewise, it is desirable to provide for continuous trucking from the general depressed floor level between tracks to the parts cleaning, parts reconditioning and stores areas. Where ramps cannot be provided to permit crossing the tracks, some arrangement of pivoted or removable bridge rails must be placed in each of the pit tracks.

The auxiliary shop areas referred to should include a separate room for cleaning parts, a separate room for repairing parts, and a separate storeroom. As regards the location of these facilities, it seems particularly desirable that the storeroom extend over the stubbed end of the truck repair track, and that the parts cleaning and reconditioning areas be so located as to provide for the normal sequence of movement of parts through these facilities and either back to locomotives being repaired or to stock in the storeroom. It is also important that the storeroom be served both by rail and roadway to permit the ready delivery of parts, materials and lubricating oil.

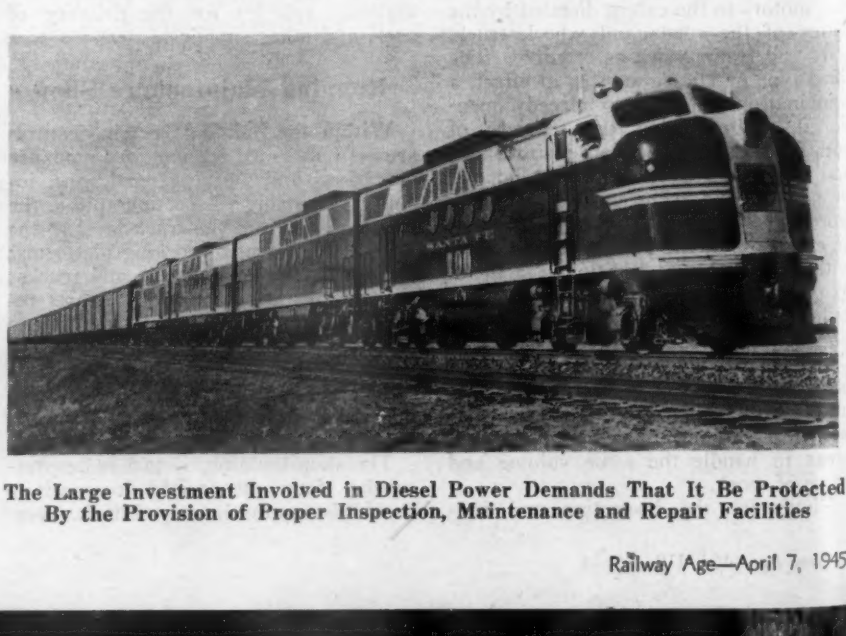
Provision should be made in these various auxiliary facilities, for a storeroom office and a shop foreman's office, and, at the most suitable place in the building, for toilet and locker room facilities. Basement areas beneath the parts cleaning and reconditioning shops, and the storeroom, can be used effectively for certain classes of truck work, electrical work, etc., and also for the reclaiming and storage of lubricating oil.

On the basis of the classes of maintenance to be carried out in this type of shop, no overhead traveling cranes are necessary through the main shop bay if drop tables are provided, although the provision of monorail or jib cranes at specific locations may be desirable where the locomotives involved require that parts and units be removed from overhead, rather than out the cab doors. Furthermore, such hoisting equipment as may be required within the parts cleaning and reconditioning areas can be confined to monorails or to portable or fixed jib cranes.

Lighting and Heating

General artificial lighting within the shop should be of the overhead type, affording a minimum of shadows, and otherwise adequate to the maximum efficiency of shop operations. This should be supplemented by moisture-proof lighting fixtures and power receptacles at intervals along both sides of the inspection pits. Power, battery charging, electric welding and extension-cord lighting receptacles should be provided along all elevated working platforms as required, and beneath all such platforms as may be desirable to facilitate work on the sides of trucks and underframes.

Heating throughout the shop should



The Large Investment Involved in Diesel Power Demands That It Be Protected By the Provision of Proper Inspection, Maintenance and Repair Facilities

preferably be furnished by means of unit heaters at the roof truss level, and in cold climates consideration should be given to special pit heating to thaw snow and ice from the running gear of locomotives, and thus simplify and speed up truck inspection and repair work.

To insure the ready removal of exhaust gases from locomotives in the shop, whose engines must be run during either inspection or maintenance operations, consideration should be given to ventilating facilities. Depending upon the extent to which scheduled operations call for the running of engines within the shop, the means of ventilation may be of several different types, including roof louvres and exhaust jacks located over the pit tracks. Where considerable running of the engines is contemplated, consideration should be given to a type of ventilating system which conveys the exhaust gases directly from the exhaust pipes of the different locomotive units to ventilators above the roof level. This system is not only the most efficient, but also interferes to a minimum extent with the heating of the shop.

Oil Storage

Provision should be made in shops for a central lubricating oil storage and reclamation plant, with separate piping systems extending longitudinally beneath the centers or edges of all elevated working platforms—one for the drainage of worn lubricating oil, and the other for new or reclaimed lubricating oil for make-up requirements or oil changes. Supplementing these piping systems, there should be multiple, flexible-hose connections along the edges of the platform, opposite each locomotive unit position, for effecting oil make-up or oil changes simultaneously in all of the units, or in any one or more of the units, without the necessity of moving the locomotive from its normal position in the shop.

Where oil reclamation facilities are provided, the same piping system for handling new oil, through a series of valves, can be used to pipe the reclaimed oil to locomotives.

In shops intended for the heavy maintenance of Diesel locomotives, including complete engine, generator and traction motor overhauls, as well as for inspection and light repair work, the facilities to be provided should be fundamentally the same as in the case of the inspection and light maintenance shop, with the major addition of a crane bay along one side, and suitably enlarged shop areas for engine, generator and traction motor overhauling work, as well as for the cleaning and reconditioning of parts and for stores purposes. In other words, the features of floors, pits, elevated platforms, lighting, heating, ventilation, lubricating oil supplies, distribution, etc., in the light maintenance section should be essentially the same as those already referred to in connection with independent light maintenance shops.

The crane bay of a heavy maintenance shop should be located immediately adjacent to one side of the light maintenance section and should include at least one heavy repair track, as well as a truck overhaul pit track, this latter track being tied in with the drop pit installation serving the tracks in the light maintenance section and replacing the truck repair pit that would normally be located in the light maintenance section. Where only one locomotive repair track, in addition to the truck overhaul track, is to be located in the heavy maintenance bay, this bay should be approximately 50 ft. wide, with a concrete or other suitable floor at normal rail level.

The pits in this section should be of concrete construction, the truck overhaul pit being at least 20 ft. long, and the locomotive repair pit at least 100 ft. long. Immediately beyond the end of the pit area and at the same floor level, accommodations should be afforded for overhauling engines and for work on generators and traction motors. Beyond this area, and extending beyond the rear end of the shop proper, should be suitable areas, as in the case of independent light maintenance shops, for the cleaning and reconditioning of parts, and for a storeroom—the storeroom, preferably, to be located between the engine overhaul area of the heavy maintenance bay and the areas for cleaning and reconditioning parts.

Again, as in the case of light maintenance shops, the storeroom area, and that occupied by the parts cleaning and reconditioning facilities, should be at the level of the elevated platforms in the light maintenance section, and thus obviate trucking between two levels. With the floor in the general overhaul area of the heavy maintenance bay at track level, this will require the provision of a ramp between this area and the areas given over to the stores facilities and for the cleaning and reconditioning of parts. However, this disadvantage is considered less serious than a difference in floor level between the elevated platforms of the light maintenance section and the stores, cleaning and parts reconditioning areas.

For the removal, handling and resetting of Diesel engines and generators, and the handling of trucks as may be necessary, the heavy maintenance bay should be equipped with an overhead traveling crane of at least 25 tons capacity. Additional hoisting equipment, preferably jib cranes, either fixed or portable, should be installed, as necessary, within those areas of the shop where the overhauling of engines, generators and traction motors is to be done.

As in the case of light maintenance shops, the areas beneath the elevated floors of the storeroom and the parts cleaning and machines shops, can be utilized for the storage of lubricating oil and for such repair operations as may seem desirable.

Where the shop for heavy Diesel maintenance and repair is to be located entirely independent of the light maintenance facilities, it is evident that it should have at least all of the facilities called for in the heavy repair bay of the combined type of shop described, plus a duplication of many of the auxiliary facilities that are required in a strictly light maintenance shop, such as machine shop, cleaning room, storeroom, lubricating oil storage, etc.

The specific shop tools and other equipment with which each shop should be equipped do not come within the scope of this report. Suffice it to say that what will be required will depend upon many factors, including the policy of the road as to repair programs, whether on a progressive (distributed) basis, or a periodic basis; the policy of the road with regard to utilizing the repair facilities of the Diesel locomotive builders or other manufacturers; and the availability of existing shop tools and facilities at other points of the road.

Use of Existing Facilities

As indicated at the outset of this report, it may prove possible and desirable in some cases to adapt existing available steam locomotive facilities for Diesel locomotive maintenance, as has already been done by a number of roads at various points. However, when this is to be done in the future, experience indicates that, in the interest of cleanliness—an essential in Diesel maintenance shops—and the greatest efficiency of mechanical operations, certain fundamental features be incorporated in the adapted facilities, some of which are similar to those desirable in new Diesel shop layouts.

Among these features is complete separation of the Diesel shop area from the steam shop area, by the construction of partition walls, to exclude the dust, soot and moisture normally found in enginehouses and steam locomotive shops. Where inspection and light maintenance are to be carried out, other features should include the two working-level arrangement recommended in new light maintenance shops, involving a continuous elevated platform, at locomotive deck level, along each side of each running repair track; a depressed general floor level, 30 in. below the top of pit rails, for a width of at least 5½ ft. out from each pit rail; and a type of elevated platform construction which will allow 6-ft. underclearance for workmen and ready access to the sides of locomotives for truck and underframe work.

Still other features that should be incorporated in converted existing facilities include a separate Diesel parts storeroom; suitable areas for cleaning and reconditioning parts, preferably at the level of the elevated working platforms; adequate general and pit lighting; a suitable exhaust system for the removal of locomotive gases; proper heating facilities; and, where the number of locomotives handled warrants, a piped lubricating oil make-up and change system. In addition, where adequate toilet and locker facilities are not already available, they should be provided.

C. & N. W. Fiscal Progress Outstanding

Earned income before fixed charges of $110,695,760 in past four years enables road to continue phenomenal financial feats, carry out extensive property improvements and reduce operating costs

CONTINUING the extraordinary financial progress made since the Interstate Commerce Commission's final plan for its reorganization was approved by the federal courts, the Chicago & North Western on April 4 awarded a $54,000,000 issue of first mortgage 3 per cent bonds, series B, due January 1, 1989, to Kuhn, Loeb & Co. and associates, on a competitive bid of 99.31, an average annual interest cost to the railroad of 3.03 per cent. The bonds were reoffered for sale to the public at 100.

The fiscal progress achieved by the North Western within the past four years has been made possible by its recent large earnings. During the four years, 1941-1944, the road earned income available for fixed charges of $110,695,760, as compared with $21,554,392 earned in the preceding four years, 1937-1940. In addition to reducing its capitalization, these earnings have enabled the company also to carry out extensive property improvements and to reduce operating costs.

The Company

The Chicago & North Western was formed in 1859 to acquire the Chicago, St. Paul & Fond du Lac upon foreclosure sale. Consolidations with a number of other railroad companies were effected between 1859 and 1883. On June 28, 1935, the company commenced reorganization proceedings under section 77 of the bankruptcy act and on October 12, 1940, an I. C. C. plan of reorganization was approved by the federal court. Following its submission to security holders and creditors, the plan was confirmed by the court on June 27, 1941. The company's properties were returned to it on June 1, 1944, new securities were issued, and, on March 1, 1945, reorganization proceedings were formally terminated.

Reduction in Capitalization

When the company was put through the I. C. C.'s financial wringer, it emerged very dry indeed. As a result of the reorganization, fixed interest debt was reduced by 71.3 per cent and interest charges thereon by 75.7 per cent. Contingent interest funded debt and stock were substituted in part for previously existing fixed interest debt (see Table I).

During 1944, after consummation of the plan of reorganization, further reductions were effected in outstanding funded debt and capital stock, with resulting decreases in annual fixed and contingent charges on funded debt and annual dividend requirements. These further reductions were accomplished in part by the recovery, at a net cost of approximately $19,500,000, of securities having an aggregate par or stated value of approximately $58,700,000, which had been distributed to the Reconstruction Finance Corporation pursuant to the

Table I—Capitalization

Capitalization[1]	Reorganized Company: At Dec. 31, 1944, Giving Effect to Refunding Operation and Redemption of Collateral Notes	Reorganized Company: Dec. 31, 1944	Reorganized Company: June 1, 1944	Prior to Reorganization: May 31, 1944
Fixed Interest Debt:				
First and General Mortgage Bonds, Series A, 4%	$	$47,979,442	$55,762,556	$ .....
First Mortgage Bonds, Series B, 3%	54,000,000	.....	.....	.....
First Mortgage, Sioux City & Pacific Division 4% Bonds	.....	4,000,000	4,000,000	.....
First Mortgage, Des Plaines Valley Divisional 4% Bonds	.....	2,499,000	2,500,000	.....
Fifteen Year Collateral 4% Notes	.....	6,224,000	24,855,000	.....
Secured Serial Payment Notes, 4%	.....	.....	2,160,028	.....
TOTAL FIXED INTEREST DEBT, EXCLUSIVE OF EQUIPMENT OBLIGATIONS	$54,000,000	$60,702,442	$89,277,584	$350,384,859
EQUIPMENT OBLIGATIONS	21,485,857	21,485,857	15,824,747	15,824,747
Total Fixed Interest Debt	$75,485,857	$82,188,299	$105,102,331	$366,209,606
Contingent Interest Debt:				
Second Mortgage 4½% Convertible Income Bonds, Series A	89,652,672	89,652,672	105,058,904	.....
TOTAL DEBT	$165,138,529	$171,840,971	$210,161,235	$366,209,606
Stock:				
Preferred Stock, Series A, 5%	$ 91,452,638	$ 91,452,638	$106,996,076	.....
7% Preferred Stock	.....	.....	.....	22,395,000
Common Stock, no par, stated at $100 per share	81,630,264	81,630,264	104,890,166	.....
Common Stock—$100 par value	.....	.....	.....	158,440,300
Total Stock	$173,082,902	$173,082,902	$211,886,242	$180,835,300
Total Capitalization[1]	$338,221,431	$344,923,873	$422,047,477	$547,044,906
Annual Requirements				
Fixed Charges:				
FIXED RENTALS, ETC.	$ 9,034	$ 9,034	$ 9,034	$ 9,034
FIXED INTEREST	2,029,537	2,837,635	3,925,397	16,131,558
TOTAL FIXED CHARGES	2,038,571	2,846,669	3,934,431	16,140,592
Contingent Charges:				
CONTINGENT INTEREST[2]	4,034,370	4,034,370	4,727,650	.....
TOTAL FIXED AND CONTINGENT CHARGES	$ 6,072,941	$ 6,881,039	$ 8,662,081	$ 16,140,592
CAPITAL REQUIREMENTS AND DIVIDENDS:				
Sinking funds:				
First Mortgage Divisional Bonds	$	$ 32,500	$ 32,500	$ .....
First Mortgage Bonds	270,000	.....	.....	.....
Second Mortgage Bonds[3]	656,491	656,491	549,040	.....
REDEMPTION OF NOTES	.....	.....	651,003[4]	.....
Dividends on Preferred Stock	4,572,632[5]	4,572,632[5]	5,349,804[6]	1,567,650[5]
Total	$ 5,499,123	$ 5,261,623	$ 6,582,347	$ 1,567,650
TOTAL ANNUAL REQUIREMENTS	$ 11,572,064	$ 12,142,662	$ 15,244,428	$ 17,708,242

Notes:
[1] Excludes capital stock and funded debt held in the treasury of the company or pledged.
[2] Maximum accumulation 13½% of principal amount; accumulations within maximum payable in any event.
[3] Increases annually by amount equivalent to interest on bonds acquired by sinking fund, if such interest is earned, as provided in the mortgage.
[4] $435,000 annual reduction fifteen year collateral 4% notes while stock of certain subsidiaries was pledged. This obligation cancelled in 1944.
216,003 annual maturity of secured serial payment notes, all of which were redeemed during 1944.
$651,003
[5] 7%—Non-cumulative.
[6] 5%—But cumulative only to the extent that available net incmoe applicable for the purpose exceeds payments.

plan of reorganization; and in part by the redemption of $20,791,028 aggregate principal amount of notes issued under the plan to the R. F. C. and to so-called bank creditors.

Recently, the company deposited with the trustee under its collateral trust indenture dated January 1, 1939, sufficient funds to redeem on July 1, 1945, the next redemption date, the remaining balance of $6,224,000 of the company's fifteen year collateral 4 per cent notes due January 1, 1954. The company guarantees the payment of principal and interest of the Chicago, St. Paul, Minneapolis & Omaha first mortgage 5 per cent bonds, series A, dated March 1, 1930, and due March 1, 2000, issued in the principal amount of $45,186,000. These bonds, which are owned by the company and pledged under its collateral trust indenture, will be returned free of pledge upon redemption of the collateral notes.

Net proceeds from the sale of the $54,000,000 bond issue awarded this week, together with sinking fund moneys and funds from the company's treasury, are to be applied to the redemption on July 1 of three mortgage bond issues now outstanding in the hands of the public in the amount of $54,364,442. All of the $47,979,442 of the company's first and general mortgage 4 per cent bonds, series A, due January 1, 1989, will be called for redemption at 104.35 per cent and accrued interest and a total of $7,783,180 of these bonds, previously outstanding but now held in the company's treasury, will be cancelled. The $3,904,000 of first mortgage, Sioux City & Pacific Divisional 4 per cent bonds, due January 1, 1969, will be called at 102.35 per cent and accrued interest and $96,000 of these bonds held in sinking fund will be cancelled, and $2,481,000 of first mortgage, Des Plaines Valley Divisional 4 per cent bonds, due January 1, 1969, will be called at 102.35 per cent plus interest and $19,000 of these held in sinking fund cancelled.

Table II—Summary of Earnings

Years	Railway Operating Revenues	Railway Operating Expenses	Operating Ratio %	Net Railway Operating Income	Income Available for Fixed Charges	Fixed Charges	Contingent Interest Charges	Net Income
1944	$166,966,117	$117,930,666	70.63	$23,086,701	$24,345,079	$3,781,803	$4,455,215	$16,108,061
1943	161,014,173	110,004,866	68.32	30,210,747	31,754,799	4,061,208	4,727,651	22,965,940
1942	138,395,019	94,341,803	68.19	33,228,999	34,601,342	2,933,619	6,007,854	25,659,869
1941	109,866,461	80,866,471	73.60	19,085,076	19,994,540	2,816,835	6,014,223	11,163,482
1940	92,800,307	73,162,961	78.84	10,094,500	11,134,206	2,926,837	4,822,566	3,384,803
1939	87,250,460	72,274,873	82.84	5,722,260	7,255,021	2,926,497	643,721	3,684,803
1938	81,055,869	71,046,384	87.65	125,511*	1,273,757	16,549,740	.....	15,275,983*
1937	89,802,536	81,354,132	90.59	37,401	1,891,408	16,702,506	.....	14,811,098*
1936	91,969,298	77,030,000	83.76	5,260,641	7,028,491	16,702,496	.....	9,674,005*
1935	77,345,496	65,348,579	84.49	3,578,483	5,891,431	16,961,779	.....	11,070,348*

* Deficit.

Note A.—The company has been collecting commercial rates for some traffic on which certain government departments claim that land grant rates apply and have filed claims for refunds. There has been withheld from operating revenues and from net income, and included in the general balance sheet account "Other unadjusted credits," the following amounts for possible readjustments: 1944—$1,800,000; 1943—$2,500,000.

Note B.—Cost of road property and equipment acquired or constructed to further the war effort, which is chargeable to investment in road and equipment, presently is being amortized by charges to operating expenses over a five year period. The following amortization charges were included in operating expenses:

	1944	1943	1942
Road Property	$31,446	$33,161	$15,831
Equipment	2,555,860	2,207,723	569,786
Total	$2,587,306	$2,240,884	$585,617

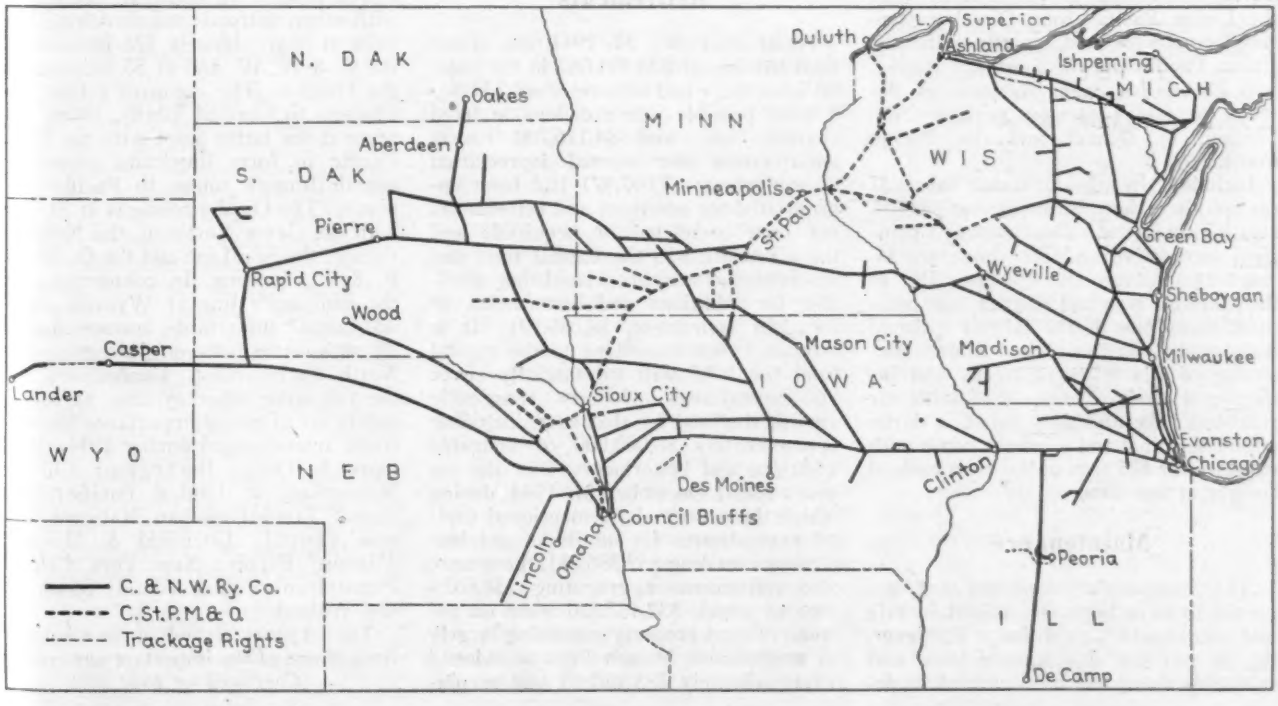
Dividends

Fixed interest debt at December 31, 1944, and annual interest charges thereon, adjusted to give effect to completion of the present financing and the scheduled redemption of the fifteen year collateral notes, show a net reduction in fixed debt of the reorganized company after June 1, 1944, of $29,616,474, or 28 per cent, and in annual fixed interest charges of $1,895,860 or 48 per cent. The reductions indicated are and will be affected somewhat by equipment obligations retired and new equipment financing completed during the current year.

Comparisons of capitalization and annual requirements, illustrating the effect of the reduction in funded debt, capital stock, fixed and contingent interest charges and preferred stock dividends, are presented in Table I. A summary of earnings for the ten years ended December 31, 1944, prepared from the company's condensed income accounts, is presented in Table II.

Capital Fund

Since the reorganization plan was consummated, $20 a share has been paid on the series A, 5 per cent preferred stock, $5 of which represented ordinary dividends for the calendar year 1944, and $15 special dividends in lieu of ordinary dividends which would have accumulated during the five years beginning January 1, 1939, the effective date of the plan, had the shares been issued on the effective date and no dividends



paid since. One dividend of $5 per share has been paid on the common stock since consummation of the plan.

Despite the extensive debt retirement in 1944, at the year's end current assets of the North Western amounted to $71,535,921 and current liabilities to $51,342,115, leaving a net working capital of $20,193,806. In addition, the company's balance sheet showed two other liquid items listed under investments and not carried among current assets. These were a capital fund of $23,304,662, of which $2,861,010 was in cash on deposit, $20,001,181 in U. S. government securities, and $442,471 due the capital fund for December, 1944, carried in the cash account and paid into the capital fund in January, 1945; and deferred maintenance funds of $4,100,000, also invested in U. S. government securities.

Equipment Owned

The company's investment in equipment is carried at $167,016,514 and accrued equipment depreciation at $83,213,454, leaving net investment at $83,803,060. Deducting from this total the $21,485,857 of equipment obligations, the road's equity in its equipment amounts to $62,317,203.

On December 31, 1944, the number of units of locomotives, cars and service equipment owned, with the number held subject to equipment obligations shown in parenthesis, was as follows: 1,058 steam locomotives (19); 63 Diesel-electric switching locomotives (51); nine Diesel passenger locomotives (5); 47,575 freight cars (10,650); 1,204 passenger-train cars (110); 1,415 work equipment and 41 miscellaneous equipment. The total original cost of the equipment against which the $21,485,857 of equipment obligations are issued, was $42,636,300.

In addition to the equipment listed above, the company owns, jointly with the Union Pacific, four Diesel passenger locomotives and, jointly with the Union Pacific and the Southern Pacific, two Diesel passenger locomotives devoted to fast passenger service from Chicago to Denver and the Pacific Coast.

Included in these trains are 37 cars (other than Pullman equipment) also jointly owned. The company's principal locomotive and car shops are located at Chicago. At Proviso, Ill., in the Chicago terminal district, the company owns one of the largest railroad freight yards in the United States, consisting of 224 miles of tracks and including a modern hump yard with car retarders, classification yards, a large engine terminal and a freight house with capacity for 625 cars of less than carload freight at one time.

Maintenance

The company's properties are reported to have been maintained in safe and serviceable condition. However, due to wartime shortages of labor and materials there has been carried to deferred maintenance reserves, invested in United States government securities, an aggregate of $4,089,852. Expenditures for maintenance of way and maintenance of equipment, exclusive of depreciation, amortization and deferred maintenance, during the years 1935 to 1944, inclusive, were as follows:

	Maintenance of Way and Structures	Maintenance of Equipment
	(Exclusive of depreciation, amortization and deferred maintenance)	
1944	$18,436,626(a)	$23,379,000
1943	15,954,823(a)	19,242,757
1942	14,751,434	17,776,057
1941	14,124,124	15,433,967
1940	13,344,463	12,988,176
1939	13,861,270	12,570,466
1938	13,093,043	12,485,877
1937	14,942,577	17,910,824
1936	15,117,216	15,159,743
1935	12,427,546	11,792,414

(a) Also excludes retirement charges incident to non-depreciable road property retired and not replaced.

An extensive additions and betterments program for the company's properties was initiated during the period of its reorganization, progress on which has been retarded by war-induced shortages of material and labor. During the six years ended December 31, 1944, capital expenditures for additions to and betterments of road property aggregated $16,463,696 and capital expenditures on account of new equipment and improvements to existing equipment aggregated $36,123,085. Additions and betterments to the extent made since January 1, 1939, in process of completion, and scheduled for 1945, have been or are to be paid for directly out of the capital fund, which the company is required to create and maintain under the terms of the mortgage and its second mortgage, except to the extent financed by issuance of equipment obligations, principal installments of which are charges against the capital fund as they mature.

Retirements

As at December 31, 1944, out of the total balance of $23,304,662 in the capital fund, there had been reserved $3,000,000 for possible future deficits in fixed charges, etc., and $4,116,700 excess amortization over normal depreciation of equipment; $8,097,971 had been appropriated for additions and betterments not then completed or acquired; and there remained in the capital fund unreserved and unappropriated, but available for additions and betterments or for debt retirement, $8,089,991. It is estimated that accretions to the capital fund for 1945 will substantially cover all expenditures properly chargeable against the fund for that year, including approximately $8,000,000 of budgeted additions and betterments. For the six years ended December 31, 1944, during which there were above-mentioned capital expenditures for additions and betterments totaling $52,586,781, there were also retirements aggregating $58,665,848, of which $32,467,320 were on account of road property consisting largely of unprofitable branch lines abandoned (approximately 383 miles) and surplus or obsolete property removed, and $26,198,528 represented equipment retirements.

The company operates 8,072 miles of railroad in Illinois, Wisconsin, Iowa, Minnesota, Michigan, North Dakota, South Dakota, Wyoming and Nebraska, of which approximately 950 miles are double track (see map). Included are 4,535 miles of main line and 3,209 miles of branch lines owned and 328 miles operated under trackage rights. Complementary to the company's lines and included in the Chicago & North Western System are approximately 1,617 additional miles of railroad, of which 193 miles are double track, in Wisconsin, Minnesota, Iowa, South Dakota, and Nebraska, operated by the Chicago, St. Paul, Minneapolis & Omaha, in which the C. & N. W. has a 93.66 per cent stock interest. Operated by the Omaha are 1,087 miles of main line and 456 miles of branch lines owned and 74 miles operated under trackage rights. The system's routes of heaviest traffic are between Chicago and Omaha; Chicago and the Twin Cities, Minneapolis and St. Paul, through Milwaukee; Eau Claire and the Twin Ports, Duluth and Superior; Milwaukee and Green Bay; Omaha and the Twin Cities; the Twin Cities and the Twin Ports; and from upper Michigan ore deposits to the lake ports of Escanaba and Ashland.

Connections

Since October 1, 1944, the Omaha has paid to the Chicago & North Western approximately $9,400,000, a part of which was on account of principal of open account indebtedness and the balance interest accrued in the North Western's accounts prior to the institution of reorganization proceedings.

The company and the Omaha have connections with each other's lines at fifteen places. In addition, connections with other railroads and switching lines exist at approximately 178 locations on the C. & N. W. and at 53 locations on the Omaha. The company's line from Chicago to Council Bluffs, Iowa, connects at the latter point with the Union Pacific to form important transcontinental through routes to Pacific coast points. The Omaha connects at St. Paul with the Great Northern, the Northern Pacific, the Soo Line and the C., M., St. P. & P., forming, in connection with the company's line at Wyeville, Wis., additional important transcontinental through routes between Chicago and the North Pacific coast. Connections with the following other systems at various points are of major importance based on traffic interchanged during 1944: Baltimore & Ohio; Burlington; Chicago, Milwaukee, St. Paul & Pacific; Erie; Grand Trunk-Canadian National; Illinois Central; Litchfield & Madison; Missouri Pacific; New York Central; Pennsylvania; Rock Island; Santa Fe; and Wabash.

The territory served by the company's lines is one of the important agricultural

(*Continued on page 626*)

Proposed Gas-Turbine Road Locomotive

Characteristics of the prime mover and of the locomotive by which it is powered discussed on the basis of a proposed 4,800-hp. unit

By J. T. RETTALIATA
Allis-Chalmers Manufacturing Company

SINCE no water is required in its operation, the gas-turbine cycle should be particularly attractive for locomotive installations. Elimination of the now necessary water-treating provisions and frequent inspections, cleanings, and repairs of boilers used on present steam locomotives should certainly be desirable. Of additional importance would be the improved operating schedules possible on runs which formerly made stops for water.

The large amount of excess air used in the gas-turbine combustion process permits a clear stack completely free from smoke at all loads on the unit. The desirability of such a feature in view of some present city ordinances is manifest.

The purely rotary motion of the gas turbine will result in minimum maintenance and vibration. Absence of any reciprocation, with its concomitant unbalanced forces, is obviously beneficial. Since the elements of the gas turbine are similar to those of steam turbines, maintenance after development should be essentially of a moderate order, except for such additional work as might result from the higher temperatures employed. Several oil-refinery gas turbines have demonstrated an exceptionally high order of reliability by operating continuously for as long as two years without shut down.

Lubrication costs of the gas turbine should not exceed one per cent of the fuel costs.

Dynamic Braking

It would undoubtedly be desirable to have a coal-burning gas-turbine locomotive, but, notwithstanding the promising experiments with pulverized coal, there may be an appreciable time interval before this is realized. The inherent low heat release of coal, necessitating relatively large combustion-chamber volumes, when compared with liquid fuel, limits its consideration at present to stationary plants where space and weight are not at a premium as in mobile installations. Colloidal fuels should also be given consideration, but in their present state high preparation costs somewhat lessen their attractiveness.

When dynamic braking is considered, the application of the gas turbine to locomotives is exemplary. By operating the traction motors as generators, the motorized main generators may be loaded by driving the gas turbine and its associated compressor. The energy required during compression can be dissipated by discharging the compressed air to the atmosphere.

This is an abstract of a paper presented before a session of the Oil and Gas Power and Railroad Divisions held on November 29, 1944, during the annual meeting of the American Society of Mechanical Engineers at New York. The discussion is based on a proposed 4,800-hp. locomotive studied by the author's company.

Thermal Efficiencies

Assuming a turbine-inlet temperature of 1,200 deg. F., the simplified basis cycle, comprising a compressor, a turbine (or two turbines arranged in parallel), and a combustion chamber, will yield a thermal efficiency at the shaft coupling of about 19 per cent. If a more elaborate cycle of the reheat type, employing a moderate amount of regeneration and operating with turbine inlet temperatures of 1,200 deg. F. is adopted, thermal efficiencies of 25 per cent are possible. With a hydromechanical type of transmission of 90 per cent efficiency, these thermal efficiencies when referred to the rail would become 17.1 and 22.5 per cent, respectively. With an electrical transmission having an efficiency of 83 per cent, the respective rail thermal efficiencies would be 15.8 and 20.8 per cent. When consideration is given to the low-grade fuel oil which it is capable of using, these efficiencies make the gas-turbine drive relatively attractive.

In 1939 the Allis-Chalmers Manufacturing Company conducted an engineering study of the combustion-gas turbine as a locomotive drive. The results of this study led to the conclusion that the hydromechanical transmission, comprising reduction gear, torque converter, and hydraulic coupling, essentially duplicated the favorable performance characteristics of the electrical transmission and, in addition, had weight and efficiency advantages which made it appear as the most promising type of drive. Notwithstanding this decision, which is still believed to be justified and valid in every respect, the present paper deals with a locomotive design having electric drive.

The selection of the latter type of drive was not due to any inadequacies in the mechanical transmission, but rather to the fact that much operating experience has been acquired with the electrical type, and, therefore, advantage could be taken of its well-known characteristics, thereby permitting more intensified concentration on the development of the gas turbine itself. Furthermore, adoption of the electrical transmission appeared to be the most judicious procedure at this stage, since it would enable continued use to be made of certain established maintenance facilities and because of the fact that the railroad personnel, being familiar with it, would be required to learn only that additional operating technique pertaining to the gas-turbine equipment. After the gas turbine has been proved to be a reliable and desirable type of railroad motive-power unit, it is believed that further developments should include the mechanical transmission in order to achieve the ultimate in locomotive design.

The road locomotive to be discussed in this paper is of 4,800-hp. capacity, powered by two duplicate 2,400-hp. gas turbines, each driving, through a reduction gear, direct-current main and auxiliary electric generators. The main generator is connected to traction motors furnishing power to the axles. The overall length is 90 ft. and the distance between bolster centers is 58 ft. 4 in. The two three-axle trucks with 16-ft. wheel base have 52-in. driving wheels, and each axle is powered by a nose-hung direct-current traction motor.

The estimated weight of the locomotive is 450,000 lb. with possibilities of reduction by employing lightweight materials. The wheel loading per inch of diameter, therefore, does not exceed accepted present practice. For each power unit the common frame carrying the turbine, compressor, reduction gear, and generators is supported at three points for the purpose of maintaining correct alignment.

Train Heating

Two 2,250-lb.-per-hr. steam generators are provided for train heating. An auxiliary engine generator set of 150 hp. is provided for starting the two gas turbine power plants by motorizing the main generators. By connecting the auxiliary set directly to the traction motors, it may also be used for propelling the locomotive up to speeds of approximately 15 m.p.h., thus enabling the main units to remain shut down when it is desired to move the locomotive about the yards.

Since the use of a relatively heavy low-grade fuel is contemplated, provision is made for fuel heating. There are various methods of accomplishing this, either with steam or electrical heating, but probably the most logical would be to use the exhaust gas from the turbines. For starting purposes the light auxiliary-engine fuel, requiring no preheating, could be used temporarily in the combustion chambers of a main

power unit until the flow of exhaust gas is established.

In the space under the center of the cab between the two trucks, tank capacity is provided for 4,000 gals. of turbine fuel oil, 1,500 gals. of lubricating oil, and 2,600 gals. of water for train-heating. The fuel-oil capacity is sufficient for approximately a 10-hr. run. Two 300-gal. tanks in the rear of the cab contain fuel for the auxiliary engine and the steam generators.

After development is completed, it is estimated that the expected cost of the locomotive will be approximately $75 to $85 per horsepower.

The gas turbine* is designed for a maximum continuous operating temperature of 1,200 deg. F. In the present state of gas-turbine development it is believed that this is the maximum temperature which should be adopted for prime-mover-type power plants where continuous operation with reliability is a basic requirement.

Gas-Turbine Characteristics

The thermal efficiency obtainable with the gas-turbine locomotive will depend upon the mode of operation adopted. If high thermal efficiency were the only consideration, then maximum turbine-inlet temperature should be maintained at all loads. The variation of coupling thermal efficiency with output of one of the 2,400-hp. gas-turbine power plants would then be as shown by curve *ADE* in Fig. 1. The temperature characteristics would be as indicated by curve *ADE* in Fig. 2. Operation of this sort would necessitate a proportional reduction in the rotative speed of the prime mover as the load diminished. Curve *ADE* of Fig. 3 shows that the speed would vary from 5,000 r.p.m. at full load to approximately 1,500 r.p.m. at no load. Decreased rotative speeds, however, are undesirable where rapid response is needed because of the time required to accelerate the rotating masses of the power plant before increased output is obtained.

* For a schematic description of the combustion turbine see "Combustion Turbine as Prime Mover for Locomotives" (from a report of the Turbine and Condensing Locomotive Committee of the Railway Fuel and Traveling Engineers' Association), *Railway Age*, March 30, 1940, page 588.

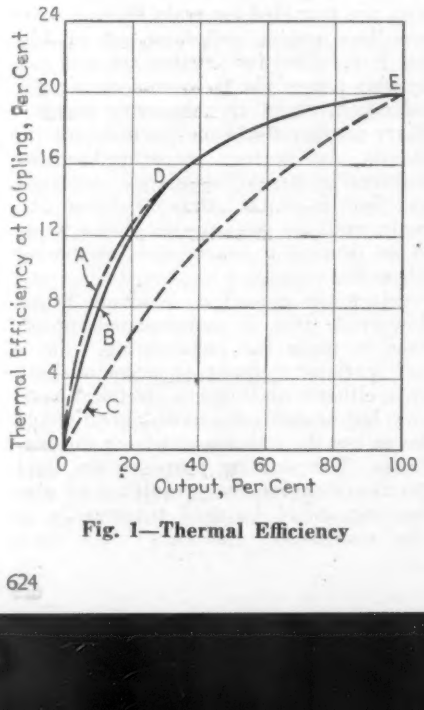


Fig. 1—Thermal Efficiency

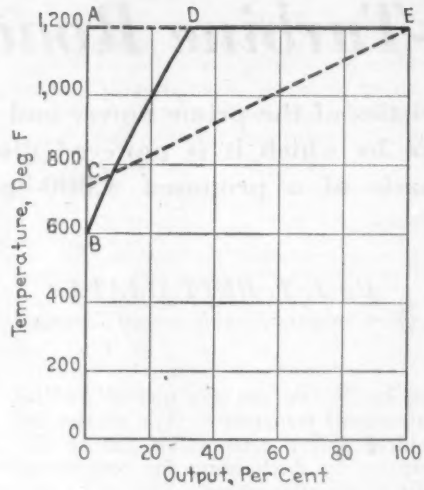
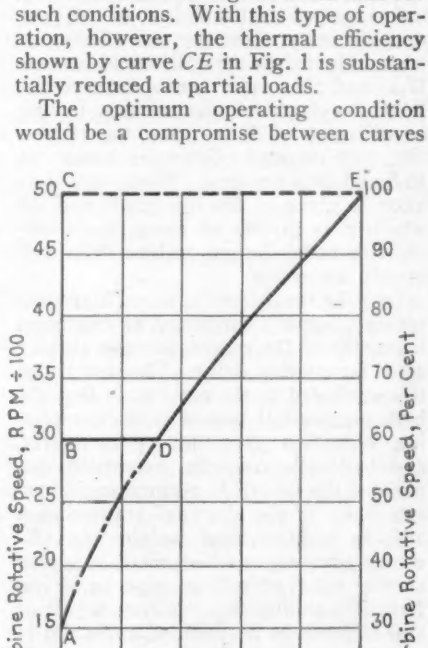


Fig. 2—Turbine Inlet Temperature

If rapid acceleration were the prime requisite, then the gas-turbine unit should be kept running at full speed (curve *CE*, Fig. 3) at all times, and variation in load accomplished by changing the turbine inlet temperature. The turbine inlet temperature (curve *CE*, Fig. 2) would vary from 1,200 deg. F. at full load to 740 deg. F. at no load for such conditions. With this type of operation, however, the thermal efficiency shown by curve *CE* in Fig. 1 is substantially reduced at partial loads.

The optimum operating condition would be a compromise between curves *ADE* and *CE*. Such performance, as determined both by acceptable acceleration and efficiency requirements, is shown by curve *BDE*, Figs. 1, 2, and 3. In establishing the mode of operation for this condition, the minimum rotative speed was limited to 60 per cent of normal. This was adopted to assure reasonable acceleration characteristics, and also to prevent the possibility of "pumping" of the axial compressor as such a tendency may exist at speeds lower than the minimum selected when the turbine inlet temperature is increased to meet load demands.



Curve *ADE*—Variable-speed, constant temperature
Curve *BD*—Constant-speed, variable temperature
Curve *CE*—Constant-speed, variable temperature

Fig. 3—Rotative Speed of a 2,400-Hp. Gas-Turbine

The temperature characteristics depicted by curve *BDE*, Fig. 2, was selected so as to maintain the thermal efficiency as high as possible over most of the load range. Accordingly, the temperature has the maximum continuous value of 1,200 deg. F. from full load down to approximately 32 per cent load, diminishing to 600 deg. F. at no load.

It will be noted that in the three different modes of operation mentioned the thermal efficiency at rated output is the same for all cases, namely, 20 per cent at the shaft coupling. Below the rated load the efficiency depends upon the type of operation selected.

Gas-Turbine Power Plant

Requirements of a good governing system are primarily the maintenance of high thermal efficiency in conjunction with beneficial acceleration characteristics. There are various ways whereby gas-turbine power plants could be controlled, and three different types will be described. The thermal efficiency under balanced load conditions will be as given by curve *BDE*, Fig. 1, and will will be the same for all types, the difference between the control methods being in the rate of acceleration.

For purposes of illustration, in each case let it be assumed that the power plant is operating at point *D* of Figs. 1, 2, and 3, and it is desired to accelerate from this point. While the maximum turbine inlet temperature has been stated to be 1,200 deg. F., a temperature of 1,300 deg. F. will be used during periods of acceleration, since the time interval is of such limited duration that no deleterious effect should result.

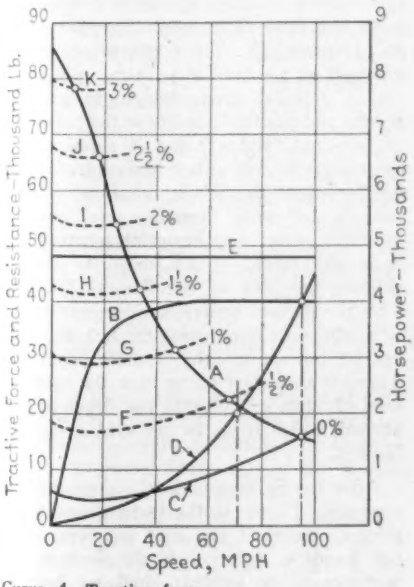
Accordingly, one method of control upon movement of the throttle in the direction of increasing speed could, under maximum accelerating conditions, immediately increase the temperature to 1,300 deg. F., while simultaneously raising the output of the power plant in accordance with a predetermined condition. For instance, by means of adjusting the generator field the output for traction purposes could be maintained in accordance with curve *DE*, Fig. 3, as the turbine rotative speed increased. Consequently, since curve *DE* is based upon a constant turbine inlet temperature of 1,200 deg. F., the additional energy available with 1,300 deg. F. goes into accelerating the rotative masses of the power plant. With such a govern-

ing arrangement, it would require approximately 45 sec. to increase the rotative speed of the power plant from 60 per cent (point *D*, 32 per cent load) to 100 per cent (point *E*, 100 per cent load).

Other Types of Control

A second type of control system could be somewhat similar to the foregoing, except that instead of keeping an external load on the power plant, as defined by curve *DE*, the load would at the initiation of acceleration when the temperature is increased to 1,300 deg. F. be held at a constant value, represented by point *D*, until full speed of the gas-turbine unit had been attained. Thus, the output supplied to the traction motors during the prime-mover accelerating period would remain fixed, while the difference between the increasing energy corresponding to a turbine-inlet temperature of 1,300 deg. F. and the energy existing at point *D* would be utilized in raising the rotative speed of the power plant up to its full value. Regulation of this sort would consume approximately 18 sec. before the rated speed of rotation was attained.

A third and still more rapid method of acceleration would comprise, at the start of acceleration, increasing the temperature to 1,300 deg. F. and simultaneously removing the external connected load from the power plant. This type of control would require the least accelerating time, since the entire gas-turbine output at 1,300 deg. F. would be devoted exclusively to accelerating the prime mover itself. In this instance the actual elapsed time before rated load would be available to the locomotive would be approximately 8 sec.



Curve *A*—Tractive force
Curve *E*—Turbine hp. available
Curve *B*—Rail hp. available
Curve *D*—Rail hp. required
Curve *C*—Resistance of 1,225-ton train on level
Curves *F-K*—Resistance of 1,225-ton train on grades

Fig. 4—Characteristic Curves of a 4,800-Hp. Gas-Turbine Electric Locomotive

Assuming the third method, or variations of it, to be preferable because of its advantageous acceleration characteristics, the means for accomplishing the desired governing could function as follows: To produce an increase in speed an advancement of the throttle would (a) introduce more fuel into the combustion chamber, a thermostatic device, however, limiting the fuel so that the maximum temperature at the turbine inlet would not exceed 1,300 deg. F.; (b) reduce the generator field so as to remove load from the prime mover, and (c) reset the turbine speed governor by compressing its spring and thereby move the governor weights closer to the vertical axis of rotation. As the rotative speed of the power plant increased up to its full value, the changing position of the governor sleeve would increase the generator field and reapply external load.

Performance Characteristics

The available tractive-force and rail-horsepower characteristics of the gas-turbine locomotive are shown as function of the train speed in Fig. 4, by curves *A* and *B*, respectively. The tangent level-track resistance of the 225-ton locomotive, when pulling cars weighing 1,000 tons, is given by curve *C*. This curve was calculated on the assumption that the locomotive was hauling 15 cars. The intersection of the tractive-force and resistance-curves shows that the 1,225-ton train will have a top speed of 95 m.p.h. when traveling on level ground. The starting tractive force of 85,000 lb. is within the limit of adhesion, assuming a coefficient of static friction of 0.25 for the 225-ton locomotive.

The variation with speed of the rail horsepower required by the train is represented by curve *D*. The maximum speed of 95 m.p.h. may also be obtained from the intersection of curves *B* and *D*. With only one gas-turbine power unit in operation, the maximum power of the rail is 2,000 hp. which, referring to curve *D*, is capable of producing a speed of approximately 70 m.p.h.

Curve *E* shows the power available at the gas-turbine coupling with both power plants in operation, amounting to 4,800 hp. at all train speeds. Except in the very low speed range, where limitations in traction-motor current may prevent full utilization of the available turbine outputs, the difference between curves *E* and *B* is attributable to the transmission losses and the power required to drive auxiliaries.

Curves *F* to *K*, inclusive, represent, at ½ per cent intervals, the resistance of the 1,225-ton train when negotiating grades from ½ to 3 per cent, respectively. The intersection of the tractive-force curve *A* with the various grade-resistance curves will give the maximum speeds at which the train can traverse the respective grades.

For a gas-turbine locomotive, having two duplicate power plants, several

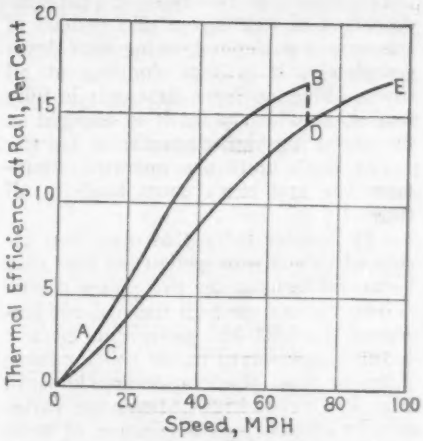
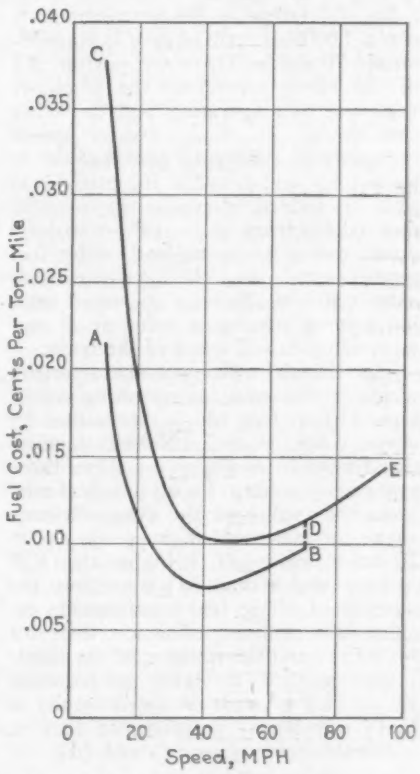


Fig. 5—Thermal Efficiency of the Locomotive at the Rail



Curve *AB*—One 2,400-hp. power plant
Curve *CDE*—Two 2,400-hp. power plants
Fuel oil of 17,790 B.t.u. per pound lower heating value at 4 cents per gallon

Fig. 6—Fuel Cost Per Ton-Mile for 4,800-Hp., 225-Ton Locomotive Hauling 1,000 Tons of Cars

general methods of operation are possible. These may be stated as follows:

(a) With one power unit shut down, the load on the other can be increased up to its full value, producing a balanced speed of the train. The speed thus attained will represent the highest capable of achievement with one engine operating at rated output. While maintaining full load on the working unit, higher speeds of the train may be reached by starting up the other power plant from a standstill and applying load to it. Maximum train speed will then exist when both units are operating at full power.

(b) Same as the type of operation described in (a) except that instead of the second power unit being shut down completely, it is kept running at all times, idling until the first unit is fully loaded, at which point it is brought in for producing higher speeds.

(c) Both units are operated simultaneously and carry equal loads at all times.

(d) Similar to type of operation described in (c), except that the load may be varied between the two power plants.

The various over-all thermal efficiencies of the 4,800-hp. gas-turbine electric locomotive referred to the rail for these different types of operation are shown in Fig. 5. Curve *ABDE* shows the variation in efficiency as a function of train speed which would occur if type (a) operation were adopted. As was shown in Fig. 4, a single 2,400-hp. unit is capable of driving the 225-ton locomotive, plus a 1,000-ton train of cars at approximately 70 m.p.h. Therefore, portion *AB* of the curve represents the efficiency with one unit operating and the other shut down. To obtain greater speeds the second 2,400-hp. gas turbine is started up and brought in, causing at first a sudden decrease in over-all thermal efficiency to *D* at the transition point, owing to its no-load idling fuel requirements. As additional power is extracted, the efficiency increases until it attains a maximum value at *E* corresponding to full speed of the train.

The thermal efficiency characteristic which would exist for operating conditions (b), (c) or (d) is represented by curve *CDE*, Fig. 5. Notwithstanding the different conditions of these three types of operations, for all practical purposes they will have the same efficiency curve as indicated. For speeds up to 70 m.p.h., curve *AB* is higher than *CD* because under type (a) operation, the absence of idling fuel requirements results in a greater efficiency than for type (b); and the running of the single power unit at a higher proportional rating at a given train speed results in more economical performance than is obtainable with types (c) and (d).

Maximum Thermal Efficiency

Fig. 6 shows the fuel costs in cents per ton-mile at various speeds. Curve *ABDE*, as previously defined, represents type (a) operation, and curve *CDE* applies to operating conditions (b), (c), or (d), whichever may be selected. It will be seen that, regardless of the type of operation selected, the optimum train speed occurs around 40 m.p.h. Obviously, this relatively slow speed could not be adhered to in modern passenger service where fast schedules must be maintained, necessitating operation in the higher speed ranges much of the time. Accordingly, the gas-turbine power units have been designed so that maximum thermal efficiency occurs at their full rated load.

The maximum efficiency of the locomotive referred to the rail is 15.8 per cent, occurring at full output of the power plants. The corresponding specific fuel consumption and cost are, respectively, 0.86 lb. and 0.43 cents per rail hp.-hr. for a fuel having a lower heating value of 17,790 B.t.u. per lb. and costing four cents per gal. The maximum ton-miles hauled per gallon of fuel occurs at approximately 40 m.p.h. and amounts to 530, representing a fuel cost of 0.0076 cent per ton-mile. At maximum speed the ton-mile per gallon figure is 275 at a fuel cost of 0.0146 cent per ton-mile.

Fiscal Progress

(*Continued from page 622*)

regions of the country, has substantial iron ore deposits and other natural resources, and includes well industrialized sections which manufacture and process varied products. Most of it is highly competitive territory served by numerous other railways, as well as by highway carriers, and, in part, by water and air carriers, and pipe lines. The company has a shorter average haul per ton than is typical of most railroads serving the Middle West.

The nature of the territory served by the company results in a well diversified traffic which varies from year to year according to agricultural and business conditions. The Omaha's traffic likewise is diversified but it does not have any iron ore traffic. Ordinarily, more than half of the freight traffic handled by the Omaha also is handled by the C. & N. W., and this constitutes about 15 per cent of the company's freight business. Currently about 53.6 per cent of its total tonnage hauled originates on the Chicago & North Western, of which 17.8 per cent terminates on line and 35.8 per cent is delivered to connections. Of the remaining 46.4 per cent received from connections, 29.7 per cent terminates on line and 16.7 per cent is delivered to connections. During the six pre-war years, 1935 to 1940, inclusive, an average of 57.3 per cent of total tonnage originated on the company's line, of which 26.2 per cent terminated on line and 31.1 per cent was delivered to connections, and 42.7 per cent was received from connections, of which 33.9 per cent terminated on line and 8.8 per cent was delivered to connections. About 44 per cent of gross freight revenues are derived from manufactures and miscellaneous, 18.8 per cent from mine products, 15.5 per cent from agricultural products, 8.7 per cent from animals and products, 5.6 from forest products and 7.4 per cent from all l. c. l. freight.

Are We Destroying One Form of "Fascism," Only to Install Another in Its Place?

One prediction can perhaps be ventured for the year just opened. It will bring into the open the principal subterranean conflicts which have been germinating for a long time in human society.

We all suppose that the war in which we, the "democracies," are engaged is a war against "fascism." So it is, if by "fascism" we mean all forms of dictatorial regimes. The essence of "fascism" is totalitarianism. That is its *real* crime against man. Any government can be absolute in fact, whatever its form, even democracy. In this sense any government can be "fascist," even democracy, for a democracy resting upon absolute majority rule is totalitarian, and that is "fascism"—"neo-fascism" if you like, but fascism just the same.

Now one phenomenon is observable in all directions where the anti-Nazi forces are emerging from their catacombs; it seems to be present wherever these forces step into the open and disclose their programs. The "democracy" that they envisage has all the marks of absolutism with all power vested in the majority and the majority a single class, the "worker" class. . . .

All these things spell the same thing, a movement to establish a "democracy" which will be essentially absolutist, that is, resting on unrestricted majority rule. If this form shall establish itself generally in the European countries as they are reconstructed, the net result will be that they have exchanged one form of "fascist" tyranny for another.

Now the fact is that we have here in this country precisely the same development but most of us seem unaware of its existence. . . . There has grown up amongst us a school of political opinion and a political group which, in part, openly and positively scoffs at the notion of personal "rights," and is supported by many who are either ignorant of or indifferent to the whole question. We have a left-wing "intelligentsia" who in terms reject any restraint whatever upon the "will" of the majority and ridicule the idea of the "moral law." This the present writer has demonstrated again and again during the last dozen years from the mouths of these people. There is thus developing here the same kind of "democracy" that has developed abroad, which is, as he has said, a neo-fascism. . . .

After the fighting is done and we turn our minds "home to the instant need of things," we shall find that we have on our hands a question of the first importance to be settled; shall we hold with the founders and the truly democratic order that they gave us, or shall we follow our "liberals" into a totalitarian order?

—Thomas F. Woodlock in the Wall Street Journal.

What Your Customer Is Thinking About

The best way to get a man's business is to know what he has to do and to help him do it — Here's an outline of the duties of an industrial traffic manager

By G. LLOYD WILSON

Professor, Transportation and Public Utilities, University of Pennsylvania

ONE of the most important jobs of every railroad traffic man is to help the traffic executives of the industries he hopes to serve to solve their transportation problems—including using the services of his company to as great an extent as possible. An essential step in dealing helpfully and effectively with an industrial traffic man is to understand and appreciate just what his job is—what he is trying to do.

With this knowledge the railroad man can be of greatest help to the industrial man, and incidentally to himself. The days are long past, fortunately, when carriers and industrial traffic men were sometimes gathered into rival and, in some cases, hostile camps. Differences in points of view or in attitudes toward traffic and transportation problems will probably always persist, but the knowledge of each other's problems, working techniques, and responsibilities is indispensable to sound craftsmanship in traffic management—whether from the carriers' or the industries' point of view. Differences are best adjusted when men of good-will understand each other's problems.

The following is an essay in definition—to outline the essential functions and responsibilities of the industrial traffic executive. Here, then, is what the railroad's principal customer is concerned with:

The Traffic Function in Industry—The traffic function in industrial management, briefly stated, is the assumption of responsibility for the supervision and control of all aspects of transportation in which the industrial enterprise is concerned, and the collaboration with and advice of executive management and with the management of other departments of the industry, in traffic and transportation policy, problems and procedure.

Duties of a Traffic Manager

In the discharge of the responsibility of this function, the traffic executive's activities fall into a number of distinct but interrelated areas. All of the phases of his work are related to the direction and control of all aspects of transportation affecting inbound raw materials and supplies as well as outbound finished or semi-finished products or by-products, refuse and scrap materials. It includes, or should embrace, the direction of the preparation of goods for shipment, the facilities and services used in shipment and the receiving of goods, as well as the control of the actual movement of the goods in transit and in storage.

Preparation of Goods for Shipment—The industrial traffic executive has the responsibility of working out, in collaboration with the manufacturing or production department and with the sales department, specifications and methods for adequate and efficient packaging and otherwise preparing goods for shipment. The preparation of goods for transportation, storage and delivery to buyers has implications which effect the manufacturing process and the sale of goods in form and condition acceptable to the customers. It has also direct bearing upon transportation facilities, services and rates, so that the efficient preparation of goods from the production, transportation and sales aspects can be attained only by the cooperation of the departments concerned. In many cases, standard packaging specifications have been approved by United States or foreign government agencies which must be complied with in connection with shipments in either domestic or foreign traffic, or both.

Science of Packaging

Noteworthy contributions to the advancement of packaging have been made by container manufacturers, container or shipping research laboratories or organizations, the carriers, committees of trade associations, United States government agencies and foreign purchasing missions. The activities of government agencies, including commodity divisions and the Containers and Conservation Divisions of the War Production Board, the Containers Coordinating Committee of W. P. B., United States Treasury Department—Procurement Division, Office of Lend Lease, War Department and Navy Department, have been conspicuous during World War II.

The work of these organizations have advanced greatly the science and art of preparing for shipment goods of thousands of varieties. Many of these organizations have issued or collaborated in the publication of packaging or shipping manuals for domestic or overseas shipments.

Representative of these publications is the manual published by the American Iron and Steel Institute, "Packaging, Marking and Loading Methods for Steel Products for Overseas Shipments."[1]

This excellent handbook was prepared by the Institute's Committee on Packaging, Loading and Shipping Problems in 1943 and revised in 1944. It contains general shipping instructions; a packaging detail code containing specific instructions applicable to individual commodities; specifications for protective coatings recommended to be used to prevent rust and deterioration; packaging materials and methods—wood, metal and paper; and a glossary of commodity and packaging terms.

Loading, Bracing, Stowing

After the practices with respect to the preparation of goods for shipment have been determined, the traffic function is concerned with the determination of the most adequate and efficient processes for loading, bracing and stowing the goods in the transport vehicles. This requires cooperation with the production and sales departments so that the practices desirable from the standpoint of transportation services and rates may be efficient from the manufacturing point of view and acceptable to the buyers, which is the concern of the sales department. The goal is safe, adequate and economical loading, bracing and stowing, achieved by the discriminating selection of efficient facilities and materials, the effective use of manpower and equipment, and the conservation of time and carriers' facilities.

In packing and stowing freight for shipment, the industrial traffic officer cannot be guided primarily by his own urge to economy, or by the carrier's emphasis on security of shipment—he must give full weight also to the convenience of his employer's customer who will receive the shipment.

Transportation Equipment—The traffic function embraces the responsibility for arranging with carriers for the supply of adequate numbers and suitable types of freight cars, vessels or barges, motor vehicles, or other kinds of transportation facilities. Beyond the routine duties of arranging for the regular supply of these facilities is the task of conferring with the carriers' officers and other individuals or organizations with respect to their programs on car, vessel or vehicle construction and acquisition in order to suggest improvement in design or structure of the ve-

[1] American Iron and Steel Institute, 350 Fifth Avenue, New York, Price $2.50.

hicles and to insure that an adequate supply of vehicles of the proper types and capacities will be available in order to meet future requirements. Industries which own and operate plant transportation facilities must arrange for the purchase or lease of vehicles, including locomotives, freight cars, vessels or barges, motor trucks and other equipment needed in these operations. Purchase arrangements, leases or charters are usually arranged with the collaboration of the purchasing and law departments, after the approval of executive management has been obtained.

Special types of railroad freight cars, including among others tank cars and refrigerator cars, are either owned by industries or leased from car lines. The traffic function includes arrangement for the acquisition of such equipment and the management of the routing and movement of these cars so that the loaded car-mileage may exceed the empty car-mileage, in order to avoid the penalties for excess empty mileage.

Wise Use of Surplus Equipment

In some cases, industrial concerns own and operate barges or other transportation vehicles, which are not needed in the same quantities throughout the year, so that surplus equipment is available from time to time for lease to others. Traffic management has the responsibility of using its knowledge of transportation conditions and its acquaintanceship with traffic and transportation men to arrange for the advantageous lease of this surplus equipment to those who need it. Negotiations of this sort require close cooperation with the law, operating and other departments of the industry as well as contacts with other industries and traffic and transportation men.

Transportation Service—The traffic function extends to all phases of the arrangements for transportation services by carriers of all types, which will ensure the orderly flow of raw materials and supplies into and through the plants of the industry and of finished products, by-products and scrap from the plants. The movement of critically needed goods must be expedited, while the movement of commodities which are not yet needed may be curtailed so as to prevent the plants from being congested. This requires that the traffic flow must be under the control of the traffic executive so that its components may be accelerated or moderated as required. Embargoes must sometimes be placed to prevent plants being deluged with traffic, while, in other cases, permits to ship goods or receive them despite embargoes must be arranged.

Schedules must be arranged with railroads, steamship carriers, motor freight carriers, railway express agency or airlines, or adapted more nearly to meet the requirements of the industry. Shipments must be diverted or reconsigned from their original routes, destinations or consignees to meet the needs of changed industrial or commercial conditions. Lost or overdue shipments must be traced to establish their location or the fact of loss, so that the goods either may be delivered promptly or claim filed against the carrier responsible for their non-delivery. In collaboration with plant operating departments, arrangements must be made by the traffic executives for the prompt placement, unloading and release of inbound cars as well as for the placement of cars for outbound loading and the prompt loading, billing and furnishing of forwarding instructions for such cars. Similar arrangements must be made for handling in cooperation with the operating departments of the plants for shipments transported or to be transported by vessel, barge or motor vehicle.

Remedying Delays

The causes of delay in the loading, unloading, release and furnishing of billing instructions for freight cars and other vehicles containing inbound and outbound shipments are studied in order to discover underlying causes and for the application of necessary remedies by the traffic and plant transportation and operating executives.

Arrangements are made after consultation with plant operating and transportation officers, the law department and executive officers for the acquisition of track connections, trackage facilities, loading platforms, loading racks, wharf facilities and other facilities for the connection of the plants with transportation instrumentalities of all sorts.

In like manner, arrangements are made in cooperation with the sales and purchasing departments and with the collaboration of the law department for warehouse and other storage facilities for the storage of goods at or near the points of production or markets, at transhipment points, or at strategic transit storage points.

Demurrage Control — A corollary of the function of freight car supply and the loading and unloading of freight cars and their release is the responsibility for the control of the demurrage charges for cars, barges or other transportation equipment detained beyond the period of free time allowed for loading or unloading.

The traffic executive must interpret and apply the carriers' demurrage tariffs and, when desirable, propose that the tariff rules and regulations be modified. He assists plant transportation and operating officers to devise and enforce procedures which will curtail as much as possible the detention of cars beyond free time. Arrangements are made for the institution of "average demurrage agreements" with the carriers in connection with inbound or outbound cars, when such agreements are advantageous, so that the credits earned by the prompt release of cars within the first 24 hours of free time may be used to offset in whole or in part the debits accrued on cars held beyond the period of 48 hours' free time. Demurrage arrangements are also made with respect to lighters, car-floats, barges, vessels, and also where demurrage rules and charges are operative with respect to motor vehicles.

Average demurrage agreements are made by shippers and carriers under regulations governed by the Interstate Commerce Commission.

Weight Agreements — The traffic function includes the negotiation and accomplishment with the carriers through their Inspection and Weighing Bureaus for the acceptance of shipments for transportation upon the basis of "agreed weights" fixed by the shipper, subject to inspection and verification by the Inspection and Weighing Bureaus. These arrangements, if properly made and adequately policed, are of mutual value to the shippers and carriers through savings made possible by the elimination of the necessity of weighing individual shipments of articles which are identical in weight.

Credit Arrangements—Another duty which is a traffic function is the negotiation, in cooperation with the treasurer of the industry, of arrangements with the carriers under which freight may be transported and delivered in advance of the payment of freight charges. Credit accommodation arrangements are made under regulations of the Interstate Commerce Commission with rail, domestic water and motor carriers subject to the Interstate Commerce Act.

Routing—The selection of the types of transportation services to be used and the individual carriers or combination of carriers to be used in routing shipments is an important aspect of the work of traffic management. The judicious selection of routes is imperative not only to insure the best service available under varying conditions of traffic and to insure adequate transportation services at the most favorable rates under these circumstances, but also to insure the equitable distribution of tonnage among the carriers of different types and among individual carriers of these types.

Claims Against Carriers—The traffic executive has the responsibility for devising procedures and practices which will insure that all claims for loss, damage or delay of shipments in transit via any transportation carrier will be detected and the claims prepared properly and filed promptly before they are outlawed by statutes of limitation or by the carriers' claim regulations. This requires the coordination of the work of the shipping and receiving departments of the plants with plant operating and manufacturing department officers and with those responsible for shipping and receiving procedure and records. Claims for loss, damage or delay in interstate commerce must be prepared and filed within nine months of delivery or, in case of non-delivery, within nine months of a reasonable time for delivery, in order to protect the claimant's rights

under the Interstate Commerce Act to file suit in event the claims are declined wholly or in part.

Another aspect of the claim function is the discovery of overcharges and undercharges with respect to carriers' freight bills, through auditing prior or subsequent to payment. This requires collaboration with the carriers and with the accounting and treasury department officers to arrange for the revision of the bills before payment, or for the collection of the overcharges through overcharge claims filed against the carriers, or for the payment by the industry of deficiencies in transportation charges resulting from the carriers' undercharges.

Prayers for Reparation

Reparation claims made by those who have paid and borne the charges and presented by carriers to the Interstate Commerce Commission for authorization after the rates have been declared unlawful, strictly speaking, are not claims but retroactive rate adjustments. The traffic executive must decide before proceeding with complaints alleging unlawfulness of rates whether or not reparation is to be sought. If so, appropriate prayers for reparation are made in the rate proceedings so that the carriers and Commission may be properly apprized of the complainant's intention not only to attack the rate as presently unlawful but to assert its unlawfulness in the past and to claim reparation for the damage suffered because of its unlawfulness.

Statistics—An important phase of the industrial traffic function is the determination of the types of statistical data with respect to traffic which are to be collected, compiled, analyzed and used in the management of traffic affairs. Records of inbound and outbound shipments must be made and retained for sales, purchasing, manufacturing and storekeeping purposes, and for the preparation and collection of claims against carriers for loss, damage and delay. Records of payments of transportation services, in like manner, must be had for fiscal and accounting purposes, and for the collection of overcharge claims and the payment of claims for undercharge. In addition to these data, statistics of tonnage, freight charges claim recoveries, transit records, must be collected and analyzed in order to know and exercise control over transportation costs, to divide traffic equitably among carriers, and appraise the results of transportation operations. Trends in the traffic capacity of the carriers and of the industry can be discerned and the necessary adjustments made through statistical analysis.

Insurance—The traffic officer's responsibilities include the determination of the transportation and storage operations of his industry which should be protected by appropriate amounts and types of insurance coverage. Insurance may be arranged for under carriers' open policies, under blanket or individual policies of insurance companies, or under self-insurance funds of the company, whichever are of greatest advantage to the company from the standpoints of adequacy of coverage, availability, and comparative cost. This includes not only the protection of goods in transit inbound or outbound via water carriers whose rates do not include marine insurance, but many aspects of transportation services where the carriers' warehousemen's liability may not include the hazards to which the goods may be exposed, where the maximum limits of the carriers' liability may be inadequate or where there are breaks in the continuity of the liability of carriers or warehousemen.

Insurance coverage is also arranged upon vehicles, floating equipment, and other facilities used by the industry in transportation service.

Freight Rates—Perhaps no responsibility of traffic management is more important, more exacting, or more emphasized than the rate function. Rate information must be obtained and prepared for use by the traffic department and by other departments of the industry, including conspicuously the sales, purchasing, manufacturing and cost accounting departments. The proper description of the goods from the standpoint of manufacturing, purchasing, selling and transportation is determined in order to insure that the proper tariff and classification descriptions are provided and that shipments are billed in conformity with these descriptions by individual shippers and by the other industries in the trade. The traffic officers of industrial concerns have the responsibility of detecting rate discriminations and prejudices operating to the disadvantage of the goods they purchase, produce and sell; of the section or district in which they buy, manufacture or market the goods; or of the persons affected.

Watch for Violations

They examine their own and their competitors' rates and comparable rates and charges for undue or unreasonable personal, place or commodity discriminations, preferences or prejudices and for present, past or future unreasonableness or other unlawful characteristics. They examine critically all rates in which they have actual or potential interest for possible violations of the Interstate Commerce Act or of state regulatory statutes, or unconstitutional characteristics. These include violations of the "long-and-short-haul" or "aggregate-of-intermediates" clauses of the Fourth Section of the Interstate Commerce Act; of the tariff publishing provisions of Section 6 of Part I and corresponding Sections of other Parts of the Act; of the "rules-of-rate-making" Sections of the Act; of the National Transportation Policy provisions of the Act; of the Sections of the Act permitting released liability rates only under specified conditions; or of the provisions of some state statutes or constitutions which make limited liability rates unlawful or unconstitutional under any circumstances.

Contracts are negotiated by the traffic executive either directly or with the law department for the facilities or services of contract water or motor carriers or with other operators of service or owners of equipment or facilities which are used under contractual arrangements.

New rates or class ratings are negotiated with the carriers in order to accommodate new traffic or to adjust rates and charges to changed industrial or transportation conditions. Changes are recommended in the rules or regulations of classifications or tariffs as may be warranted by altered conditions in industry or transportation. Changes in the charges for special or terminal services are advocated when such modifications are justified. Generally, the traffic function with respect to rates is to keep rates and charges adjusted properly with respect to the value of the services rendered and the ability of the traffic to bear the charges.

Intervention in Complaints

At times it becomes necessary for industrial traffic officers to recommend the filing of complaints against carriers with the Interstate Commerce Commission or with other federal or state regulatory commissions or the intervention in complaints or investigations instituted before these commissions in order to protect the interests of their respective industries. This is not only the proper assertion of the reasonable self-interest of every shipper but a duty which should be assumed so that the commissions may have all the facts and points of view which are relevant and material to the matters in issue.

The preparation to assert or defend the industry's interest in complaints, investigations or litigation involves the preparation by the staff of the traffic department of rate, route and shipping distance data in the form of testimony and exhibits, and the presentation of evidence of the effects of the proposed purchase and marketing of the goods. Changes in rates and charges upon the expert testimony is prepared by officers of the industry competent to testify with respect to the effects of the changes upon the purchasing, manufacturing, sales, and transportation practices of the companies. In many cases the chief traffic officer or members of his technical staff bear the burden of presenting this testimony before the Commission with the counsel and guidance of members of the legal staff of the company.

Traffic Law—Traffic managers in industry are required by the nature of their responsibilities to be informed with respect to statute law, decisions and orders of the Interstate Commerce Commission and of state commissions, and court decisions which prescribe or interpret the rights and duties of shippers and carriers under the law. Not only

must they know the specialized commerce law as a framework or background to their work but they keep currently informed with respect to changes in this highly volatile field of law, and, with the advice and counsel of the law department, interpret and apply it to their companies' operations and transportation practices. A broad field of quasi-law is contained in the orders of government regulating commissions, such as service orders of the Interstate Commerce Commission and of the United States Maritime Commission, and orders of the Office of Defense Transportation, War Shipping Administration and War Production Board. These orders, rulings and directives are studied and arrangements are made with the departments of the industry affected in order to insure compliance. Negotiations are conducted for relief from the orders or for their interpretation or modification by the agencies which have issued them if compliance with all or parts of the orders are unreasonably prejudicial or unduly burdensome to the industry.

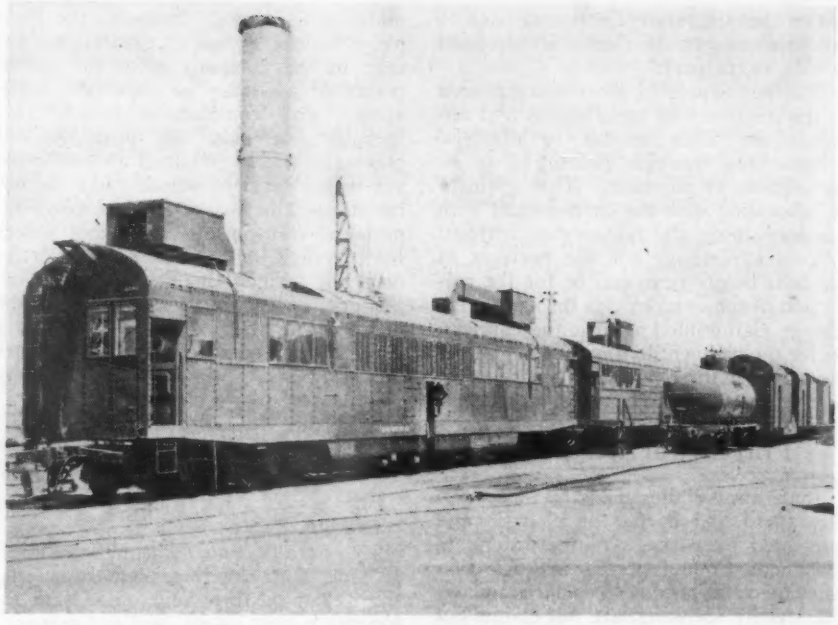
Conspicuous Assistance

Traffic executives individually or as members of committees or associations of shippers are consulted by government agencies and their assistance and counsel is sought in the formulation of orders and directives of the government agencies which affect the transportation and traffic interests of their companies or the trades in which they are engaged. Conspicuous work has been done in the present war by prominent industrial traffic managers and by traffic organizations, such as the National Industrial Traffic League, the Shippers Advisory Boards, and the Associated Traffic Clubs of America, and by traffic committees of many industries.

Rate-Making and Service Conferences — Industrial traffic executives work to constructive purpose in appearing before carrier traffic associations or conferences or rate bureaus in order to present directly to the carriers' rate officers the industrial aspects of rate problems.

The rates are made by the carriers as a responsibility of carrier traffic management; but the facts and opinions with respect to the necessity for the rates or their adverse effects upon industries, sections of the country, or the development of commerce can be ascertained best by the carriers through face-to-face discussion of the matters with the traffic executives of the industries or communities affected.

In like fashion, transportation service matters are discussed with the operating officers of carriers through the Shippers Advisory Boards which function to translate industrial car-service needs and other operating requirements of the industry into available car supply by ascertaining in advance the probable numbers and kinds of cars required by shippers of all principal commodities for three months in the future. Available freight cars can be mobilized so as to have them on hand where and when needed, to the advantage of shippers, carriers and the public. Perhaps no transportation service has been more conspicuous in recent years than the stretching of available car supply by heavier loading, faster movement, better distribution and better timing in the allocation of freight car supply.



A 10,000-Kw. Mobile Steam Power Plant Now in the Service of the U. S. Navy at Mare Island Yard, Calif.

This unit is one of two built by the General Electric Company for the Bureau of Yards & Docks, U. S. N. It is designed to be hauled by rail to supply power at any west coast Naval establishment. The stack and the two air-conditioning units mounted on the roof are demountable. Coupled to the boiler car at the right is the turbine-generator car. Four other cars making up the complete unit are the switchgear car, transformer car, a freight car, and a gondola car. The two latter cars carry accessories. A tank car, not part of the train proper, supplies Bunker C fuel for the boiler car. Sectionalized rubber hose is used to carry circulating water from the bay to the condenser and back to the bay.

* * *

Passenger Transportation — Traffic departments of industries are also charged with the duty of obtaining transportation reservations for the officers of their companies who must travel on business. Under present conditions this function is often one of the most troublesome, difficult and inadequately appreciated work of the traffic department staff. Refunds are obtained from the carriers for unused tickets. Itineraries are arranged for company travelers who without this aid might be stranded en route for days on end.

Transportation Statesmanship—This brief essay in definition of the traffic function in industry would be incomplete without some mention of the work of organizations of traffic men and of individual industrial and commercial traffic managers in presenting the problems and point of view of industry to the railroads, and interpreting the carriers' points of view and their problems to industrial executives. These organizations and individuals are not only advancing intelligently and constructively their own reasonable self-interest but they are working unselfishly for the improvement of transportation facilities and services and in conserving—in the best sense of that word—the transportation, industrial and commercial structure of this country.

Traffic Statesmanship

They also serve the important function of presenting to the committees of Congress the problems of their industries and of industries and communities generally so that the members of Congress can get first-hand evidence of the transportation requirements of industry, commerce, sections of the country, and the public who use the transportation facilities and pay the charges for transportation services.

The transportation industries, their industrial and commercial employers, the government and the public generally owe a heavy debt of gratitude to these organizations and individuals. It would be obviously unfair to single out particular persons for approbation when space precludes mention of them all. But certainly the leaders, officers, committee chairmen and members of such organizations as the National Industrial Traffic League, the Shippers' Advisory Boards, the Associated Traffic Clubs of America and its individual member clubs and the regional organizations of industrial and commercial traffic managers may be mentioned as at the forefront in this yeoman public service of traffic statesmanship.

Railroads-in-War News

Second Quarter Load Seen at 1944 Levels

Advisory boards put total at 9,560,945 cars compared to last year's 9,548,068

Freight car loadings in the second quarter of 1945 are expected to be practically on the same level as those of the comparable 1944 quarter, according to estimates compiled by the 13 Shippers' Advisory Boards.

On the basis of those estimates, loadings of the 28 principal commodities will be 9,560,945 cars in the second quarter of 1945, compared with 9,548,068 actual car loadings for the same commodities in the corresponding period in the preceding year. Seven of the 13 boards estimate an increase in carloadings for the same quarter of 1945 compared with the same period in 1944, but six estimate decreases.

The tabulation above shows actual carloadings for each district in the second quarter of 1944, the estimated loadings for the second quarter of 1945, and the percentage of increase or decrease.

The 13 boards expect an increase in the second quarter of 1945, compared with the same period one year ago, in the loading of 13 of the commodities listed, but a decrease in fifteen.

Among those showing the greatest increases are the following: Grain, 25.8 per cent; cottonseed and products except oil, 21.1 per cent; hay, straw and alfalfa, 9.7 per cent; all canned goods, 7.2 per cent; citrus fruits, 6.1 per cent; other fresh fruits, 6.6 per cent; manufactures and miscellaneous, 6.4 per cent; and flour, meal and other mill products, 5.6 per cent.

Commodities for which decreases are estimated include the following: Potatoes, 11.3 per cent; livestock, 10 per cent; petroleum and petroleum products, 9.6 per cent; gravel, sand and stone, 9.2 per cent; machinery and boilers, 5.6 per cent; fertilizers of all kinds, 4.5 per cent; and coal and coke, 3.2 per cent.

Shippers' Advisory Boards	Actual Loadings Second Quarter 1944	Estimated Loadings Second Quarter 1945	Per Cent Increase
New England	198,886	196,513	1.2-d
Atlantic States	1,033,274	1,062,543	2.8
Allegheny	1,272,008	1,224,410	3.7-d
Ohio Valley	1,168,052	1,128,420	3.4-d
Southeast	1,047,406	1,030,768	1.6-d
Great Lakes	639,046	669,298	4.7
Central Western	295,858	298,073	0.7
Mid-West	1,255,015	1,281,515	2.1
Northwest	714,459	785,083	9.9
Trans-Missouri-Kans.	406,485	412,388	1.5
Southwest	717,190	672,879	6.2-d
Pacific Coast	498,027	507,587	1.9
Pacific Northwest	302,362	291,468	3.6-d

MUSIC FOR HOSPITAL TRAINS.—The Canadian National Employees' War Services Association, Montreal, is asking members to donate discarded phonographs and records, needed by the Red Cross expressly for use on hospital trains.

* * * *

Signal Corps Photo

German Gun-Carriage Serves as Bridge Span

When the Germans destroyed the Pont de l'Arc bridge, which spans a river near Aix, France, plans to repair this important railroad communications link with Marseilles and other coastal towns called for a Bailey bridge (British pre-fabricated unit-type) and about three weeks of construction work. The U. S. 343rd Engineers discovered a simpler solution in a captured German railroad gun. Dismantling gun and accessories, the remaining carriage was fitted into the bombed-out section of the bridge in precisely four days.

Says VE-Day Won't Mean Less Traffic

But Byrnes' swan song predicts labor shortage will ease; advice on "spending"

In his second quarterly report to Congress and the President, issued on the eve of the announcement of his resignation from the post of director of war mobilization and reconversion, Justice James F. Byrnes expressed the view that the volume of traffic in this country will decrease only slightly from its current record high levels when Germany is defeated.

While the movement of war products will decline, he said, there will be an increase in the movement of civilian products. Moreover, the shipment of guns, tanks, and other heavy military supplies to the West coast will increase, and this will result in longer hauls and longer time for turn-arounds.

"Serious" Car Shortage—"Railroad equipment is barely adequate to continue existing services," the statement pointed out, and it went on to compare 1944 figures for freight handled with 1939, contrasting the great increase with the slight change in the available equipment. "The car shortage is serious," it said further. "Wheat and other grain, metal concentrates, and other valuable freight are being shipped in hopper bottom and gondola cars because of the lack of box cars. The opening of the Great Lakes will reduce the grain load to some extent. However, the rail movement of grain from farms to seaboard will be a heavy burden on our rail facilities."

Explaining how the Inter-Agency Deferment Committee had been convinced that the shortage of manpower had added to the difficulties faced by the railroads and had therefore granted the industry a substantially larger percentage of occupational deferments for men under 30 than most industries have been allowed under currently effective Selective Service programs for drafting men of that age group for service in the armed forces, Justice Byrnes' report went on to say that, in the second quarter after VE-Day, the manpower situation of the railroads should improve.

Repairs "in Arrears"—While an easier manpower situation should permit railroads to "greatly" increase work on maintenance of way, which is "badly in arrears," the short supply of rolling stock will limit expansion of railroad operations, according to the retiring director. "It is apparent that it will be necessary to continue wartime transportation regulations such as

compact loading of freight cars, control of rail movement to the ports to prevent congestion, and high demurrage charges to speed up turn-around of freight cars. It will be still necessary to forego unnecessary travel."

The report also pointed out that "the strain will continue on both truck and bus lines," but it held out hope that "some increases in equipment will be possible after the defeat of Germany." It also was predicted that there would be some increase after VE-Day, in the allocation of gasoline for civilian use.

While the demands that will be made on transportation facilities after the fighting ends in Europe may require that travel restrictions be continued, it also was suggested that conditions might permit some modifications in the restrictions currently effective. The report stated specifically that the ban on horseracing, the "brownout" request and similar measures which were reportedly taken in the interest of conserving fuel, manpower, and transportation, should be withdrawn after VE-Day.

In discussing the increase in the war freight movement, the report indicated that the monthly average of carloads for export handled through the Gulf ports has remained relatively constant from the first quarter of 1941 into the first quarter of this year, the increase in that time being from around 11,000 to around 15,000. The movement through the Pacific ports, on the other hand, has increased from around 5,000 cars monthly early in 1941 to around 65,000 cars monthly currently. While this increase began to be noticeable about the end of 1941, it was even more pronounced after the invasion of Normandy in the second quarter of 1944. The big increase in the movement through Atlantic coast ports was from the latter part of 1942 until the middle of 1944, since which time it has tended to level off. The monthly average handled through these ports has increased from around 31,000 cars early in 1941 to about 100,000 cars now, according to the data in the report.

Warning on "Spending" Plans—In discussing the preparations already made and to be made for reconversion from a wartime economy to one that will support a large measure of employment as military demands slacken off, the Brynes report included a recommendation that Congress should authorize the President to consolidate and curtail government agencies after the defeat of Germany is definitely accomplished. At the same time it definitely warned against being "stampeded" into large "public works" expenditures to meet a brief slump in employment that is to be expected after VE-Day.

"State and local governments now have increased revenues," it said. "The temptation to start such programs will be great, particularly in those areas where there is temporary local unemployment. Nevertheless, public works projects should not be undertaken to provide jobs while the war with Japan lasts. The starting of such projects could easily interfere with war production and with the rapid reconversion of war plants to civilian production."

General relaxation of construction controls will not be possible after VE-Day, it was predicted, but some construction—"the reconversion of industrial facilities, public utilities, rail improvements, highway improvements, and schools"—may be permitted to go ahead, although "first consideration should be given to deferred maintenance and repairs."

While opposing "public works" as means of absorbing unemployment before the defeat of Japan, Justice Byrnes offered some suggestions toward the expansion of such activities in the post-war period. While he resigned in advance of the actual achievement of VE-Day, it was said that he felt the "war mobilization" part of the director's job was substantially completed, so that it would be well for his successor, whose chief concern would be the "reconversion" part of the job, to be in charge of the office and of the shaping of policy for the post-war period. Nevertheless the current report contained some proposals for post-war preparations.

Lots of "Public Works"—A committee named on February 17 by Justice Byrnes, and still functioning, has under way the development of a "realistic" list of "public works" that can be started quickly when Japan is defeated, the report pointed out. This committee has concluded that there are about $4,500,000,000 of federal projects authorized by Congress which could be placed under way rapidly, while the estimated backlog of non-federal public projects, private construction, and housing, would amount to another $2,500,000,000. The report recommended that "sufficient funds should be made available now to the construction agencies to permit the preparation of detailed plans and specifications to avoid delay when it is feasible to place the program under way. Projects involving state consent or participation should be worked out now."

A brief survey of the possible situation after the end of the war with Japan was incorporated in the report. "New businesses will develop to produce, market, advertise and retail not only those goods which the people have done without during the war," it suggested, "but also new products which will make for better living. Free enterprise should thrive in this post-war atmosphere. It is the opportunity for free enterprise to prove that it can provide full employment. Labor and management must reconcile their divergent views so that they may work together for this objective."

The same theme was developed in the conclusion to the report. "America is still a land of opportunities where our system of free enterprise makes the most of each of these opportunities," wrote Justice Byrnes. "Government, as we know it, has never provided in itself nor can it ever provide full employment. Free enterprise, controlled in the common interest but not restricted in development can provide full employment for those who want to work."

The resignation of Justice Byrnes was announced April 2, as was the appointment of Federal Loan Administrator Fred M. Vinson as his successor, subject to Senate confirmation. No intimation was given at that time as to who would succeed Judge Vinson as loan administrator, a post he had held only a few weeks, following the "resignation" of Jesse Jones.

3rd M. R. S. Director Becomes Brigadier General

When 34-year-old Colonel Frank S. Besson, Jr., director of the Third Military Railway Service and now the youngest Army Ground or Service Forces general in the Army, received word that the Senate had confirmed his nomination to brigadier general, he immediately wrote a letter of thanks to the men of his command. The letter, published in the Third M. R. S.'s paper, "The Red Ball," follows:

"Many of you men, stymied by lack of 'T/O' (Table of Organization which allots grades for each Army unit) vacancies, are doing work which calls for a higher grade. In spite of failure to receive deserved promotion, you have never failed to do more than required in delivering goods to Russia.

"It is paradoxical that your outstanding successful performance has resulted in rewarding—not yourself—but me.

"I have no illusions about who has earned the promotion I have received. I realize that my good fortune is a by-product of your desire to get this job done, to get the war over and to get back home.

"While I appreciate the fact that I owe my promotion to the work of you men in the Railway Service, I am nevertheless mighty happy to be a brigadier general—and I thank you all sincerely for the honor you have bestowed upon me."

Said to be "tremendously popular" with the Army railroaders he has commanded since he became director of the Third M. R. S. last May, the general, when time permits, besides playing basketball with the officers' team also plays softball with the enlisted men. Until he went to the

Photo by P. G. C., U. S. Army

General Besson Receiving the Silver Star, Symbolic of His New Rank, from Brig. Gen. Donald P. Booth, Commanding the Persian Gulf Command—the Ceremony Was Performed at Headquarters, in Teheran

Persian Gulf Command in December, 1943, as assistant director of the M. R. S., General Besson had served for four years as a member of the Engineer Board at Fort Belvoir, and later as director of development of engineer equipment, in the office of Chief of Engineers, Washington.

Asphalt Haul Restricted

Effective May 1, Office of Defense Transportation permits will be required for the transportation for distances of 500 miles or more of tar and asphalt used for road surfacing. This action was taken, the O. D. T. has announced, "to obtain the greatest possible utilization of tank cars."

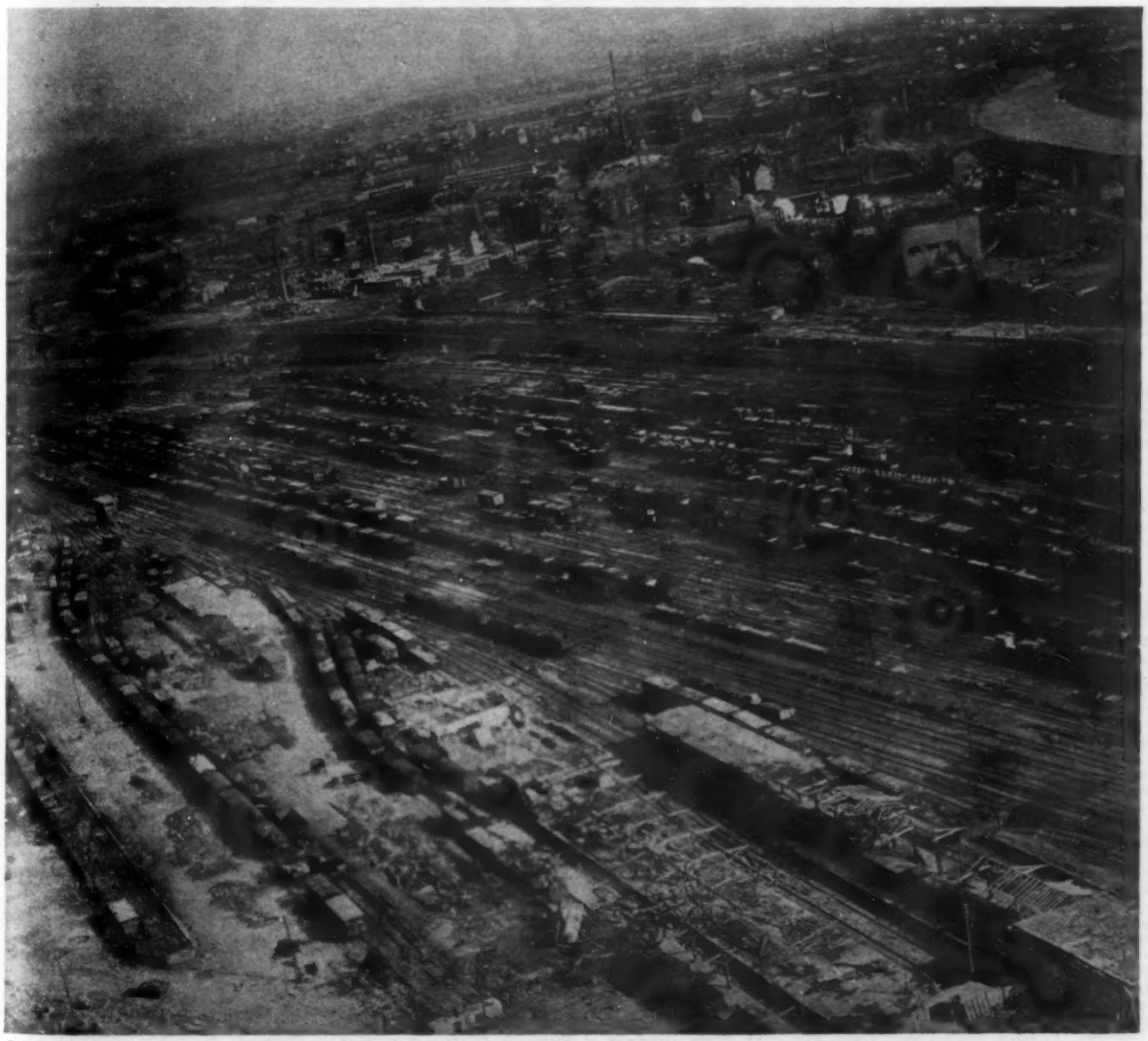
This requirement is being made effective through O. D. T. Special Direction 7-1 Revised 4. It is necessary, it was said, because more light petroleum products will be manufactured this year than last, resulting in production of more asphalt. This material must be moved from the refineries to prevent curtailment of their operations, and in view of the present overall shortage of tank cars it is expected that the tank car fleet will be "taxed to the utmost."

The limitations do not apply to shipments of tar and asphalt for industrial purposes or for military purposes if consigned on government bills of lading. "In the interest of the most efficient distribution," the O. D. T. has agreed to issue permits for specified territorial movements on a blanket certification from the Petroleum Administration. These will apply to the following movements: (1) California to destinations in that state, Washington, Oregon, Nevada or Arizona; (2) Montana, Idaho, Wyoming, Utah or Colorado to destinations in those states or North Dakota, South Dakota, Nebraska or Minnesota; (3) New Mexico, Texas, Arkansas, Louisiana, Alabama or Mississippi to destinations in those states or in Nebraska, Kansas, Oklahoma, Minnesota, Iowa, Missouri, Wisconsin, Illinois, Kentucky, Tennessee, Georgia or Florida; and (4) Kansas, Oklahoma, Missouri and Illinois to destinations in those states, in Nebraska, Iowa, Minnesota, Wisconsin or South Dakota, or to points in Indiana within the Chicago switching area.

Lord Mountbatten Praises U. S. Army Railroaders

Commending Brig. Gen. Paul F. Yount's U. S. army railroaders in India for playing a "notable part in the defeats inflicted upon the Japanese" in that theater, Admiral Lord Louis Mountbatten, Supreme Allied Commander, Southeast Asia Command, credited the Miliary Railway Service units in that area for a 100 per cent increase in traffic along the Assam line of communications. At the same time General Sir Claude Auchinleck, commander-in-chief in India expressed "high appreciation of the unstinted cooperation and aid which has been given throughout by the United States officers and units engaged in this task."

Admiral Mountbatten writing to Lt. Gen. Daniel I. Sultan, U. S. Army, commanding U. S. forces in India-Burma, declared



British Combine Photo

Damaged Railway Yards at Neuss, Germany—Before Its Capture by the American Ninth Army, March 2, the Royal Air Force Bomber Command Had Made Concentrated Attacks on This Industrial City

the Assam line of communications a "first-class example of completely integrated Allied effort." He reminded General Sultan that when he assumed command "the inadequacy of the Assam L. of C. . . . "was a major obstacle hindering the full deployment of our strength against the enemy." . . . "Through the hard work and resourcefulness of your railway battalions and those associated with them, the volume of traffic handled has mounted rapidly until the L. of C. is functioning with a substantial margin over essential requirements which will enable unforeseen contingencies to be met," the admiral went on.

Expressing "particular pleasure of the way in which the Americans have worked in the closest cooperation with the British and Indian military and civilian railwaymen and inland water transport personnel in producing these excellent results," Admiral Mountbatten said their effort had contributed greatly to the heavy defeats inflicted upon the enemy in Manipur State and in North Burma during the past year and to securing communications into China.

I. C. C. Service Orders

Because of flood conditions in Arkansas, Louisiana and Texas, railroads serving those states and affected by the high water have been directed by Interstate Commerce Commission Revised Service Order No. 299, effective April 2 through April 10, unless otherwise ordered, to reroute by the most available routes freight originating in, destined to, or moving through those states. The usual rate provisions with respect to carrier disability were invoked. The revised order supplanted the first order of that number, effective March 31, which applied only to certain lines of the Texas & Pacific and St. Louis Southwestern of Texas.

The provisions of Service Order No. 298, rerouting certain symbol train traffic, have been modified by Amendment No. 1, making the order also applicable to such traffic originating at Port Arthur, Tex., or West Port Arthur.

B. & M. Has Early Morning Radio Program

The Boston & Maine presented its first "Waker Upper Show" on April 2, when the new 15-min. program, called "a good will courier" between passengers, employees and the railroad, got under way, at 7 a.m., on WMAC, key station of the Yankee network.

The program, which will be presented each week-day, opens with a recording of the familiar steam whistle of the B. & M. 4100 series locomotives, and besides presenting the usual time, tide, weather reports and music, offers tribute to individuals, families and civic groups on the home or war fronts, and reveals human interest stories about B. & M. employees who are contributing their share to the war effort.

Materials and Prices

The following is a digest of orders and notices that have been issued by the War Production Board and the Office of Price Administration since March 27, and which are of interest to railways:

Building Materials—A summary of the current materials situation in the construction field was issued recently by the W. P. B. The impact of shortages of man-power, fuel and transportation facilities, together with increased requirements of the armed services, continues to keep building materials, especially lumber and metals, in short supply. Even for essential construction, W. P. B. warned, care must be exercised in specifying for use the following list of tight materials:

Lumber—Extremely tight, especially in 1 and 2 in. boards. Situation growing worse.

Plywood—Softwood plywood very short. Hardwood plywood not under controls but also critical.

Building Boards—Some types are short, other easy. Local supply should be checked before specifying.

Roofing Materials—Wood shingle supply very tight. Asphalt roofing becoming tight due to heavy military and overseas requirements.

Steel—Sheet and strip very tight, plate easier. Structurals tight. Rod and bar tight.

Masonry Products, such as brick, concrete, blocks and tile—Over all supply is adequate, although shortages exist in certain areas of the country. Inventory at very low level.

Cement and Concrete Products—In ample supply.

Cement-Asbestos Products—Corrugated sheets are short. Other products in fair supply, subject to moderate delays in delivery.

Screening—Very tight and subject to tight controls. Only limited emergency supply for civilian use. Civilian supply available only for protection of national health.

Cast Iron Soil Pipe—In extremely short supply. No practicable substitute available.

Pressure Pipe—Orders far exceed production. Non-metallic substitutes recommended.

Plumbing Fixtures, Fittings and Trims—Fixtures generally available. Fittings and trims in very short supply.

Heating Equipment—In short supply, particularly cast iron radiation and steel boilers. Use of all fuels restricted.

Millwork—Ceiling price increases, that have been authorized for stock millwork items since maximum prices were frozen originally at the March 1942 levels, have been extended to odd stock millwork by Amendment 6 to MPR-525, effective March 31.

Second Quarter Steel Allotments—Because of a severe shortage of steel in controlled material form available for allotment during the second quarter of 1945 the allotment of steel for all purposes, including MRO has been reduced. This applies to all MRO users under CMP Regulations 5 and 5A, and also to operators of transportation systems under Order P-142.

No operator may use the CMP allotment T-7 to get more steel (except rail and track accessories) for delivery in the second calendar quarter of 1945 than 80% of such steel authorized for purchase by him during the fourth calendar quarter of 1944 under paragraph (c) (2) of Order P-142.

It is urged that all operations under P-142 requiring steel be deferred as far as possible in order to conserve steel, and that operators use steel out of existing inventories to the greatest extent possible.

Where essential operations under P-142 cannot be feasibly postponed and an operator is prevented from carrying them on by this direction, he may apply in writing to the W. P. B., Transportation Equipment Division, for permission to buy additional quantities of steel. This applicaiton must show (1) the amount of steel he is permitted to buy and the amount he requires; (2) why the maintenance, repair or other operation must be continued, cannot be deferred and cannot be supplied out of inventory; and (3) why other maintenance, repair or operations cannot be deferred to provide the needed steel.

Surplus Materials—The Surplus Property Board recently announced that two pamphlets containing (1) Section XXII, and (2) Sections X and XI of the Handbook of Standards for Describing Surplus Property are now available at the Superintendent of Documents, Government Printing Office, at a price of 10 cents each. These sections cover the following classes of property: Section XXII—Food, Beverage and Tobacco Crude, Basic, and Finished Products. Section X and XI—Plumbing, Heating, and Air-Conditioning Equipment and Lighting Fixtures; Communications Equipment, Electronic Devices, Alarm and Signal Control Equipment.

Used Rails—Controls over sales of all grades of used steel rails other than those to be used for laying track have been tightened in an amendment to order L-88. Effective March 26, the amended order, provides that sales of used rails of relayer grade may be made:

1. By common carriers directly to industries for the purpose of laying track, without restriction and without certification.
2. To any person, other than dealers, without prior authorization, provided the purchase order is certified to the effect that the rail is to be used for laying track.
3. To dealers without authorization, provided the dealer's purchase order is certified to the effect that the rail is purchased for subsequent resale in accordance with order L-88.

Any amount of used rail of relayer grade in excess of 10 tons to be sold in any calendar month for any other purpose requires prior authorization from W. P. B. The new restrictions also bring the Army, Navy and United States Maritime Commission within the scope of the order. The order as previously written did not provide for sales of used rails to dealers and reconditioners who formerly had purchased rails and sold part of them for track work and part for other purposes.

Prices

Milling and Kiln Drying Services—Custom milling and kiln drying services on all softwood and hardwood lumber were given uniform ceilings in Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota and Wisconsin, on March 27.

Maximum prices are likewise established for similar services on the same kinds of lumber, except western softwoods, when performed in Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virginia and West Virginia. Ceiling prices on western softwoods for all States except the 12 midwestern and lake states listed above will be controlled by RMPR-539, also issued March 27.

Southern Pine—Premiums, which were authorized prior to January 15, 1945, for southern pine lumber producers, have been restored for extra standard thickness boards and dimension lumber when dressed 1/16 in. or more thicker than American Lumber Standard with the exception of one-in. boards, by amendment 8 to second revised RMPR-19, effective April 4.

The amendment establishes the following premiums and pricing method:

1. Addition of $1 per M. f. b. m. for 1¼ in. and 1½ in. boards dressed 1/16 in. or more thicker than A. L. S. for yard stock.

2. Addition of $1 per M. f. b. m. when dimension is dressed to a thickness of 1¾ in. (Industrial Standard) or more instead of 1½ in. (A. L. S.).

3. Prices for boards thinner than ¾ in. dressed one side shall be determined by deducting from the ¾ in. price $1 per M. f. b. m. for each 1/32 in. difference between ¾ in. and the thickness to be priced.

4. Prices for boards thinner than 11/16 in. (price for 11/16 in. boards requires application to O. P. A.) dressed on both sides shall be determined by deducting from ¾ in. price 75 cents per M. f. b. m. for each 1/32 in. difference between ¾ in. and the thickness to be priced.

Used Lumber—Used lumber prices, which have skyrocketed in some areas to levels exceeding ceilings of equivalent grades of new material, were placed under dollar-and-cent ceilings by General Order 61, effective April 2, and which authorizes regional and district administrators to establish specific ceilings on used lumber. Exact ceilings must be posted in dealer' yards.

Wood Pipe—Five types of wood pipe comprising machine banded wood pressure pipe; wire-wound wood pressure pipe; continuous stave wood pipe; solid bored wood pressure pipe (machine banded or wire-wound); and wood-lined pressure pipe were removed from price control April 2.

GENERAL NEWS

Last Year's Purchases Greatest Since 1923

$1,610,529,000 spent by Class I railroads for materials, supplies, and fuel

Purchases of fuel, materials and supplies by Class I railroads of the United States for use in connection with their operations were greater in 1944 than in any year since 1923, according to J. J. Pelley, president of the Association of American Railroads. The 1944 total was $1,610,529,000, an increase of $216,248,000 over 1943. In 1923 purchases of fuel, materials and supplies totaled $1,738,703,000.

Purchases increased 15.5 per cent between 1943 and 1944. This was due in part to higher prices which averaged about three per cent greater in 1944 than in 1943, and the remainder was due to greater volume purchased.

Class I roads in 1944 expended $585,832,000 for fuel compared with $527,296,000 in 1943. For bituminous coal only, their purchases totaled $429,497,000, or an increase of $54,099,000 compared with the preceding year, while anthracite purchases totaled $4,125,000, or an increase of $410,000 compared with 1943. Purchases of fuel oil in 1944 amounted to $139,598,000 compared with $136,905,000 in the preceding year. For gasoline, there was an expenditure of $6,142,000 in the past year, while for all other fuels, including coke, wood, and fuel for illumination, expenditures amounted to $6,470,000.

Purchases of forest products amounted to $158,957,000 in 1944, compared with $150,255,000 in 1943. For cross-ties, including switch and bridge ties, the railroads expended $98,376,000 in 1944, an increase of $5,505,000 above such expenditures in 1943. Purchases of lumber and all other forest products, amounted to $60,581,000, or an increase of $3,197,000 above the preceding year.

Class I roads in 1944 purchased iron and steel products amounting to $526,608,000, compared with $410,803,000 in 1943, or an increase of $115,805,000. For locomotive and car castings, beams, couplers, frames and car roofs, the railroads spent $66,114,000 in 1944, compared with $49,440,000 in the preceding year. Purchases of steel rail, including new and second-hand except scrap, amounted to $75,763,000 in 1944, compared with $60,074,000 in the preceding year; while for track fastenings, track bolts, spikes, and other such materials used in connection with the laying of rails, the railroads expended $55,229,000, or an increase of $11,425,000 above the preceding year.

For wheels, axles and tires, the railroads expended $48,791,000, compared with $44,550,000 in the preceding year; and for bar iron and steel, spring steel, tool steel, unfabricated rolled shapes, wire netting and chain, boiler, firebox, tank and sheet iron and steel of all kinds their expenditures amounted to $36,044,000, compared with $28,868,000 in the preceding year. Purchases of interlocking and signal material in 1944 amounted to $23,147,000, and for standard and special mechanical appliances for locomotives, $21,206,000.

Miscellaneous purchases made by the Class I roads totaled $339,132,000 in 1944 compared with $305,927,000 in 1943. Coming under this heading were $40,100,000 for glass, drugs, chemicals, including chemicals for timber treatment, and painters' supplies; $30,913,000 for lubricating oils and grease, illuminating oils, boiler compound and waste; $22,314,000 for stationery and printing; $59,373,000 for commissary supplies for dining cars, camps and restaurants; $27,338,000 for electrical materials; $20,582,000 for ballast; $35,853,000 for nonferrous metals and products; $8,443,000 for passenger car trimmings; and $24,782,000 for locomotive, train and station supplies.

Wallace Appears at Rail Labor Executives Meeting

Secretary of Commerce Wallace appeared last week at a Washington, D. C., meeting of the Railway Labor Executives' Association and discussed the government's plans for post-war employment. It was stated at the Department of Commerce that the Secretary's talk was made at the request of the Department of Labor.

In reporting the session, last week's issue of "Labor" said that Mr. Wallace was the first Secretary of Commerce to address an R. L. E. A. meeting. And, it added, "the union chiefs frankly voiced their appreciation that Wallace had chosen to set a precedent and talk over his ideas with them."

Bills in Congress

Chairman Wheeler of the Senate committee on interstate commerce has introduced S. 797 to provide for continuance beyond the present May 15 deadline of joint-rate arrangements between forwarders and motor carriers. The bill is like H.R. 2764 introduced previously in the House by Chairman Lea of the committee on interstate and foreign commerce, as noted in the *Railway Age* of March 31, page 604.

Senator Shipstead, Republican of Minnesota, has introduced S. 798 to amend the Interstate Commerce Act so as to increase the period of limitations on actions against railroads for recovery of overcharges from two to four years, and to authorize the making of reparation awards against motor carriers.

A.C.L. Objects to Commission's Order

Wants formal hearing before it installs signals on 2,084 miles of its line

Replying to the Interstate Commerce Commission's order to show cause why it should not be required to install upon specified lines in its system "an adequate block signal system," the Atlantic Coast Line has informed the commission that it "cannot refrain from registering a protest," both against the "broad scope of this blanket order and against this form of procedure."

Manual Block Acceptable—As reported in *Railway Age* of February 24, page 393, the order applied to almost 2,100 miles of line, giving the road the option of establishing automatic block signaling or manual block operation under prescribed conditions. It was based on commission findings that two collisions, one near Whigham, Ga., on July 1, 1942, and one at Acree, Ga., on January 27, 1943, would not have occurred if there had been an "adequate block signal system in use." The show cause order was issued in conjunction with commission approval of an A. C. L. application for authority to equip its line from Rocky Mount, N. C., via Wilmington to Florence, S. C., with an inductive train communication system. This line is not equipped with automatic block signals (except for two relatively short segments of main line involved), but it is included within the trackage subject to the provisions of the commission's show cause order.

In protesting the order, the road pointed out that it was called upon, as a result of the two accidents noted, to show cause why it should not be required to install an adequate block signal system over practically one-half of its entire system. Such action, it asserted, amounts to "putting the cart before the horse," as the road is placed in the position of being required "to rebut a proposition as to which there is no affirmative proof of record."

No Evidence to Support Order—As the Coast Line understands the law, the commission, under the amended statute, may, after investigation, if found necessary to the public interest, order the installation of the safety devices enumerated in the act. However, its argument continued, there must be an affirmative finding that such installation is in the public interest, and that finding cannot be based (under the decision in *Baltimore & Ohio* vs. *U. S.*, 264 U. S. 258) on "facts conceivably known to the

(*Continued on page 643*)

2 Months Net Income Totaled $75,000,000

Net railway operating income for the same period was $146,178,516

Class I railroads in the first two months of this year had an estimated net income, after interest and rentals, of $75,000,000 as compared with $91,361,758 in the first two months of 1944, according to the Bureau of Railway Economics of the Association of American Railroads. The two-months net railway operating income, before interest and rentals, was $146,178,516, compared with $172,212,429 in the corresponding 1944 period.

February's estimated net income was $37,400,000, compared with $46,038,301 in February, 1944; while the net railway operating income for that month was $73,163,460, compared with February, 1944's $87,214,459. February was the twenty-first consecutive month in which the net earnings of the carriers showed a decline, the A. A. R. statement pointed out. In the 12 months ended with February the rate of return averaged 3.92 per cent, compared with 4.78 per cent for the 12 months ended February 29, 1944.

Operating revenues for February totaled $712,806,326 compared with $735,305,464 in February, 1944, while operating expenses totaled $499,642,576 compared with $492,093,830. The two-months gross was $1,464,143,097 compared with $1,475,977,196 in the same period of 1944, or a decrease of 0.8 per cent. Operating expenses in the two months amounted to $1,029,875,762 compared with $996,106,904, an increase of 3.4 per cent.

Class I roads in the two months paid $261,153,300 in taxes compared with $277,797,445 in the same period of 1944. For February alone, the tax bill amounted to $127,446,071, a decrease of $13,556,003 or 9.6 per cent under February, 1944. Twenty-six Class I roads failed to earn interest and rentals in the two months, of which 14 were in the Eastern district, one in the Southern region, and 11 in the Western district.

Class I roads in the Eastern district in the two months had an estimated net income of $20,000,000 compared with $35,624,262 in the same period of 1944. For February alone, their estimated net income was $11,900,000 compared with $18,422,786 in February, 1944.

Those same roads in the two months had a net railway operating income of $49,929,320 compared with $71,551,571 in the same period of 1944. Their February net railway operating income amounted to $26,748,601 compared with $36,731,597.

The two-months gross in the Eastern district totaled $618,184,006, a decrease of 4.4 per cent compared with the same period of 1944; operating expenses totaled $477,690,728, an increase of two per cent.

Class I roads in the Southern Region in the two months had an estimated net income of $17,000,000 compared with $19,487,486 in the same period of 1944. For February alone, they had an estimated net income of $8,200,000 compared with $9,596,761.

Those same roads in the two months had a net railway operating income of $27,559,511 compared with $29,967,575 in the same period of 1944. Their February net railway operating income amounted to $13,635,199 compared with $15,555,855.

Gross in the Southern region for the two months totaled $221,047,725, an increase of 0.9 per cent compared with the same period of 1944, while operating expenses totaled $139,865,545, an increase of 4.9 per cent.

The Western district's estimated net income for the two months was $38,000,000 compared with $36,250,010 in the same period of 1944. For February alone the Western district roads had an estimated net income of $17,300,000 compared with $18,018,754.

Their two-months net railway operating income was $68,689,685 compared with $70,693,283 in the same period of 1944. Their February net railway operating income amounted to $32,779,660 compared with $34,927,007.

Gross in the Western district for the two months totaled $624,911,366, an increase of 2.4 per cent compared with the same period in 1944, while operating expenses totaled $412,319,489, an increase of 4.5 per cent.

CLASS I RAILROADS—UNITED STATES

	1945	1944
Month of February		
Total operating revenues	$712,806,326	$735,305,464
Total operating expenses	499,642,576	492,093,830
Operating ratio—per cent	70.10	66.92
Taxes	127,446,071	141,002,074
Net railway operating income (Earnings before charges)	73,163,460	87,214,459
Net income, after charges (estimated)	37,400,000	46,038,301
Two Months Ended February 28, 1945		
Total operating revenues	$1,464,143,097	$1,475,977,196
Total operating expenses	1,029,875,762	996,106,904
Operating ratio—per cent	70.34	67.49
Taxes	261,153,300	277,797,445
Net railway operating income (Earnings before charges)	146,178,516	172,212,429
Net income, after charges (estimated)	75,000,000	91,361,758

Equipment Depreciation Rates

The Chicago, St. Paul, Minneapolis & Omaha and the Maine Central are among roads for which the Interstate Commerce Commission has recently prescribed equipment depreciation rates. The Omaha's rates are as follows: Steam locomotives, 3.1 per cent; other locomotives, 4.89 per cent; freight-train cars, 3.8 per cent; passenger-train cars, 3.34 per cent; work equipment, 3.52 per cent; miscellaneous equipment, 9.7 per cent.

The Maine Central's rates are: Steam locomotives, owned, 3.13 per cent, leased, 3.79 per cent and 4.68 per cent; other locomotives, owned, 3.8 per cent; freight-train cars, owned, 2.98 per cent, leased, 5.88 per cent and 4.68 per cent; passenger-train cars, owned, 2.67 per cent, leased, 6.33 per cent and 5.96 per cent; work equipment, owned, 2.95 per cent, leased, 3.55 per cent and 5.81 per cent; miscellaneous equipment, owned, 13.73 per cent.

Air Transport Trend Won't Change Much

Post-war development will be in pre-war mold, I. C. C. staff study finds

Air transportation in the early post-war years may be expected to conform again to the pattern of its pre-war development, continuing to penetrate the so-called Class A market represented by the combined total of Pullman and airline passengers but achieving no very serious diversion of freight traffic from the surface carriers. That is the general conclusion of a study on "Some Aspects of Post-War Air and Surface Transportation," which has been issued by the Bureau of Transport Economics and Statistics of the Interstate Commerce Commission.

The study, a document of 183 mimeographed sheets, was prepared by Myles E. Robinson, transport analyst of the Bureau, under the supervision of Spurgeon Bell, head transport economist. It is Statement No. 454, and like other Bureau studies of its kind it was issued "as information," and "has not been considered or adopted" by the commission. It is the third Bureau study relating to post-war transportation conditions, the two earlier ones being "Post-War Traffic Levels," reviewed in the *Railway Age* of October 28, 1944, page 665, and "War-Built Pipe Lines and the Post-War Transportation of Petroleum," reviewed in the issue of February 10, 1945, page 313.

Costs Haven't Declined—The present study's general conclusion that the early post-war development of air transport will be on the pre-war pattern follows from its finding that air transport costs are not likely to be materially under pre-war costs in at least the first few post-war years. In this connection it is pointed out that the volume of post-war air traffic will depend upon relative operating costs of air and surface transport.

It is emphasized, however, that these and other conclusions set forth in the study are based upon two assumptions—that there will be no pronounced change in governmental subsidy to air transport, and that factors influencing post-war costs will not vary greatly from those of pre-war years. The report adds that "decision to increase public aid to airlines or to allow free competition of air and surface transport for local and trunk-line air service could modify substantially the conclusions."

Having set down these cautions, the report proceeds to state that post-war ton-mile costs for air cargo service in combination passenger-cargo planes "will probably range from 25 to 35 cents, exclusive of ground pick-up and delivery." Operating costs for all-cargo service are expected to be less, it being "possible" that they might get down to 15 cents per ton-mile (airport to airport) for specially-built all-cargo planes with a load factor of 100 per cent.

"But, up to the present time," the report continues, "this type of plane has not been employed in commercial transport. Owing

to relatively high rates to date there has been too little cargo traffic to justify substantial use of this type of plane. Furthermore, a consistent load factor of 100 per cent would seem unattainable in normal times. Even with the present war emergency the national airline average for passenger service is less than 90. Post-war load factors are not expected to rise above 65 or 70 per cent for all-cargo or for combination service."

Differential Rates—It is predicted that the airlines, "in the absence of subsidies," will experiment with differential rates to build payloads; and in the cargo field it is expected that the most probable new type of rate will be the "deferred charge," i. e., lower rates applicable to cargo sent on the first available plane which has sufficient space without making adjustments to accommodate the shipment. The air market for the movement of perishables is called "more or less unknown," for the study finds that "little evidence" that the high load factor assumed in various experiments along that line can be maintained consistently.

It is conceded that the contract carrier or air contractor "may play an important role" in post-war air transport. In this connection it is pointed out that contract air carriers are not now subject to regulation, except as to safety, while other factors favoring their growth include "the expected surplus of transport planes, the relatively low prices at which it is commonly assumed they will be sold, and the large number of experienced airplane pilots and mechanics who will be available after the war."

When all this has been said, however, the study comes to the conclusion noted above —that no very serious diversion of freight traffic from surface to air carriers seems immediately in prospect. "Air rates," it goes on, "are appreciably higher than rail express rates and still higher in comparison with less-than-carload and less-than-truckload and water carrier and pipe line rates. The vast volume of surface traffic which moves at rates of less than one cent per ton-mile is probably beyond the reach of air transport, at least for some time to come."

It is pointed out later on that although the post-war volume of air transportation is expected to reflect a "marked growth" over the pre-war years, it will probably still constitute "a very small part of the total volume of transportation." Air-express is taken as an example—its volume as measured by ton-miles could increase 3,000 per cent over the pre-war total "and still comprise less than one per cent of the ton-miles of all common carriers."

Air Cargo Prospects—Along the same line it is noted that a Curtiss-Wright Corporation study of "Air Transportation in the Immediate Post-War Period" estimates that air cargo traffic in 1948 will total 65 million ton-miles or 1,857 per cent of the 1940 volume. And it is calculated that even at this rate of growth, that 1948 total would be only nine per cent of the estimated total air traffic (passenger, cargo, and mail), and "of course, a very small fraction of total common carrier traffic." This Curtiss-Wright study is given "major emphasis" in the present study's consideration of the probable volume of early post-war air traffic.

To support its prediction that the airlines will continue their penetration of the Class A travel market the study found information which indicates that "up to one-third of the Pullman-type traffic may move by air by 1950, a doubling over pre-war penetration of combined air-Class A rail traffic." Moreover, it is noted that this estimate "is apparently regarded as too conservative by some airline officials," certain spokesmen for the industry putting the penetration as high as 80 per cent.

Meanwhile no diversion of low-rate passenger traffic of railroads and buses to the airlines "can be expected until airline operating costs are brought down from the present level." This statement is made despite an earlier prediction that the airlines may be expected to adopt a first and second-class passenger rate structure. That development, however, is regarded as "unlikely" until different types of equipment or different schedules come into use. "It is not generally regarded as feasible to charge two rates for passengers or two rates for cargo when carried on the same plane," the report says. Thus while "passenger rates may be expected to decrease in early post-war years, a reduction of more than one to one and one-half cents (per passenger-mile) is not expected with present types of equipment."

Feeder Routes—As to local or feeder air service, this "may not develop as rapidly as is expected by the more optimistic air transport authorities and enthusiasts," the report finds. "In the first place," it goes on, "rails, motor buses and trucks are strongly entrenched in the shorter haul business. In the second place, as length of flight stage decreases the airplane tends to lose the advantage of its speed differential

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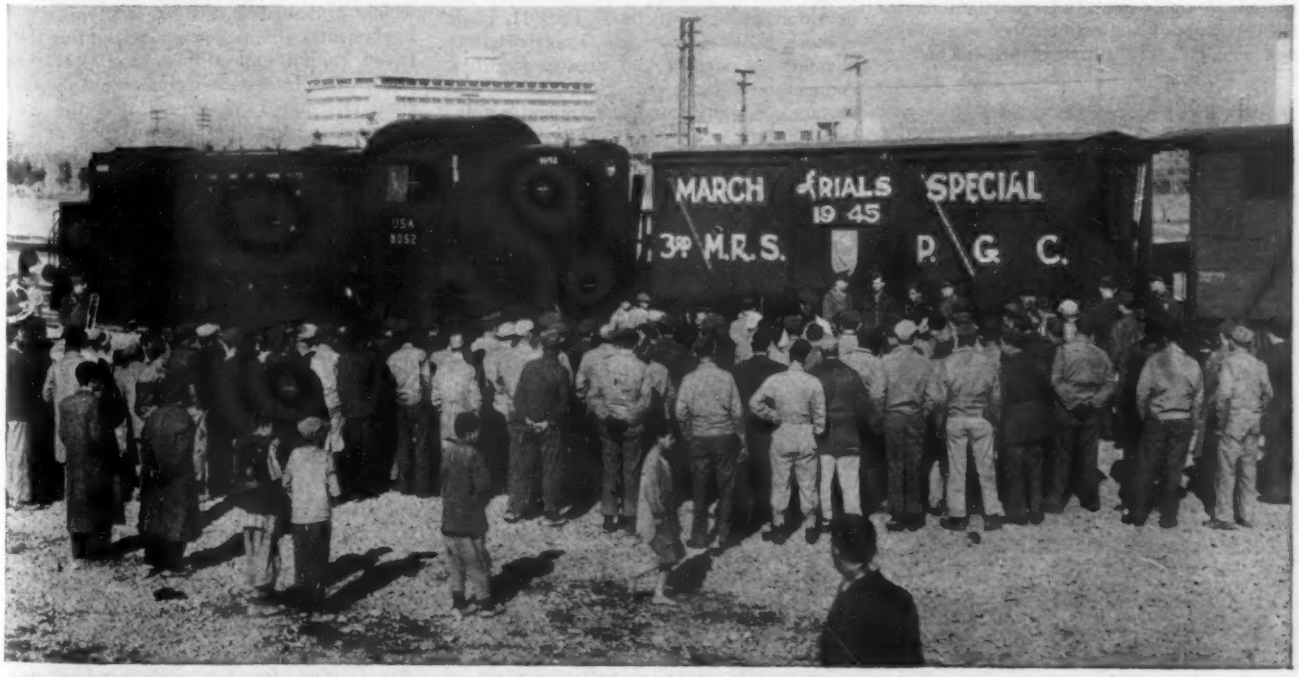

Persian Gulf Command, U. S. Army Photo

P. G. C.'s "March of Rails Special"

In its counterpart to our "March of Dimes" for the fight against infantile paralysis, the Persian Gulf Command of the Third Military Railway Service, in Iran, this year sent out an American built freight car on a train bound from Teheran for the Persian Gulf port of Khorramshahr, in what is believed to be the only campaign of its kind in an overseas war theater. Brig. Gen. Donald P. Booth, commanding, and an army band saw the train off on its tour of the "whistle stops."

over surface carriers. In addition, local air service may encounter much lower load factors than are met on main line routes, despite the use of smaller planes. Schedules may be somewhat more irregular and airport facilities less adequate. Finally, competition with contract motor carriers may be stronger than where trunk line air service is involved."

Commenting more specifically on the airport phase of the foregoing, the report says that the present set-up "is not likely to be adequate for the local or feeder service which is now contemplated." This "relative inadequacy," it adds, "may be removed if public aid, either national, local, or both, is extended through construction and maintenance of airport and airway facilities." And it finds present evidence pointing "to increased public aid as a means of maintaining or promoting the industry." Moreover, "if national policy requires the maintenance of airline transportation even though at a loss, subsidization is not likely to be limited to the provision of airport and airway services but may include reduction or even elimination of margins between payments for and cost of air mail as well as other economic aids, such as the elimination or decrease by the states of taxes on air transport companies."

The report had previously discussed the present subsidy situation, noting that the airline industry "makes little direct contribution to the cost of airport construction or maintenance." Thus airline "costs," though "much higher than those of most surface transport," are as low as they are "largely because the air carriers have little financial responsibility for the operation of airports and airways."

Terminal Costs—"In other words," the report goes on, "airline costs could be expected to rise if the carriers were required to make material contributions to the construction and maintenance of airways and airports. The extent of present airline payment for use of these facilities is small. In 1939 domestic operators paid 1.13 cents per plane-mile for "Rent of Fields, Buildings, and Offices"—an account class which includes airway and site rents, in addition to other airport charges. This amounted to 2.06 per cent of total airline operating expenses. In 1940 payments for use of airports and airways amounted to 1.54 per cent of total operating expenses, and in 1941 and 1942 were 1.51 and 1.34 per cent, respectively.

"Within the past two or three years, particularly in the face of the unprofitable nature of most airport operations, there have been suggestions that all carriers make at least a 'user' contribution to terminal costs. Such a charge is required in many instances. The Chicago Municipal Airport is an example. Landing fees are charged on the basis of the number of daily scheduled flight operations of a carrier. For each of the first two regularly scheduled flights the operator must pay $200 a month, for each of the next three the charge is $100, and next three cost $50 each, and all remaining schedules are rated at $25 each. An airline with eight daily schedules would thus pay $850 a month to land at the Chicago port. In addition, $1,500 yearly is charged for each 24,000 sq. ft. of hangar space.

"However, the general contribution of the airlines remains small. In 1942 total payments of 19 domestic airlines (including non-passenger-carrying lines) for the use of airports were only $1,133,126, or an average of $59,638."

These comments on airport finances are found in a chapter on "the nature of air transport," which appears in the report's Part I—Development and Characteristics of Air Transport. The other two chapters in that part comprise the introduction to the study and a discussion of the historical development of the airlines. Part II, Basic Factors in Post-War Air Transport, has chapters on airport and airway facilities, commercial aircraft, costs of operations, and surface competition and government regulation. Part III, Trends in Early Post-War Air Transportation, carries the conclusions as to the probable character and traffic of post-war domestic air service.

What Surface Carriers Can Do—Among other comment in the section on "surface competition" is a prediction that the surface carriers will not remain idle while business is being lost to the airlines. "Two steps to meet air competition," the report continues, "seem available to rail and motor operators—to improve their own service or to lower rates, or both, and to engage in air transport directly, through subsidiaries, or indirectly through participation in joint routing. Post-war surface transportation may be more efficient and less expensive than pre-war transport. While plans of most carriers must remain in the blueprint stage, there is evidence that some marked improvements may be expected.

"A recent survey of post-war plans of railroads indicated among other things that much present passenger equipment is considered to be outmoded and will be replaced by modern lightweight equipment, that fares will be reduced immediately after the war to capitalize on the advertising and publicity value, and that to hold passenger business some railways plan to participate in air transport, if permitted."

The survey on which the study based this comment was the one made by *Railway Age* in 1943 and published in the article entitled "Railways Alert to the Necessity of Meeting Postwar Competition," which appeared in that year's Passenger Progress Annual, the issue of November 20, 1943, page 794.

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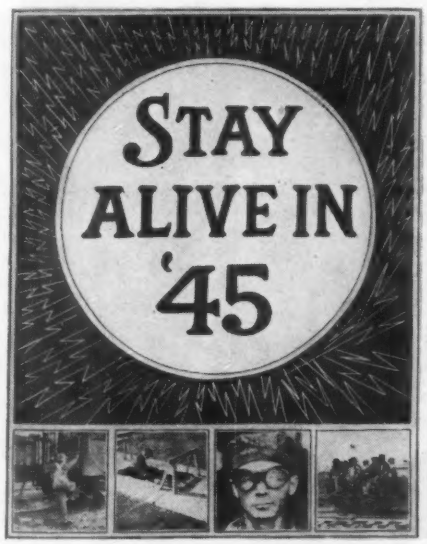

Poster No. 259, Which Constitutes the April Installment of the "All the Year —Every Year Safety Program," Now Being Distributed by the Committee on Education, Safety Section, A. A. R.

Three New Comptrollers Elected To Controllers Institute

James B. Donnelly, comptroller of the Minneapolis, St. Paul & Sault Ste. Marie, at Minneapolis; Paul D. Fox, deputy comptroller of the Pennsylvania, at Philadelphia, and J. W. McMillian, comptroller of the Gustin-Bacon Manufacturing Co., at Kansas City, Mo., have been elected to membership in the Controllers Institute of America, a technical and professional organization devoted to improvement in controllership procedure.

C. of N. J. to Have Inductive Radio Installation

To coordinate switching movements, the Central of New Jersey will install an inductive-type radio system in its Allentown, Pa., yards, William Wyer, chief executive officer, announced April 5. The installation will be made in the yard office at the westbound hump and on locomotives working in that section of the yard. Radio also is being studied for possible application at other points along the railroad, Mr. Wyer added.

Must Charge Post Driving to Investment Account

Reporting in the No. 29140 proceeding which it describes as one involving "the fundamental distinction in accounting between capital expenditures and operating costs," the Interstate Commerce Commission, Division 1, has ruled that the cost of driving posts into the roadbed at the ends of ties to arrest water pockets and mud heaves is a capital investment, chargeable to road account No. 3, Grading. Only the cost of removing the ballast and resurfacing is found chargeable to operating expenses.

The proceeding, an investigation on the commission's own motion, was instituted May 19, 1944, after the Texas & Pacific, the Texas & New Orleans, and the Louisiana & Arkansas had disputed contentions of I. C. C. bureaus of accounts and valuation that the expenditures involved should be charged to investment. The railroads contended that the charges should be to operating expenses, and Commissioner Porter expressed agreement with that view in a dissenting expression. The majority report represented the view of Commissioners Mahaffie and Lee.

In entering its order, the majority found it unnecessary to amend the accounting classification, for the work involved was found to be within the present description of the property covered by grading account. Dissenter Porter suggested that the post-driving work is like that of applying a patch to a leak on the roof of a box car, it being

News Department continued on next left-hand page

READING COMPANY

FORTY-SEVENTH ANNUAL REPORT FOR THE YEAR ENDED DECEMBER 31, 1944

Philadelphia, Pa., March 27, 1945.

To the Stockholders of Reading Company:

The Board of Directors submits herewith its 47th Annual Report of the operations and affairs of the Company for the year ended December 31, 1944:

	1944	1943	Increase or *Decrease*	
Average miles of road operated	1,408.21	1,418.21	*10.00*	*0.7%*
Receipts from the transportation of anthracite and bituminous coal, merchandise, passengers, etc.	$115,793,963	$113,784,670	$2,009,293	2%
Cost of operating the railroad and maintaining the property	82,691,229	73,679,210	9,012,019	12%
Net Revenues	$33,102,734	$40,105,460	*$7,002,726*	*17%*
Federal, State and other taxes	$18,629,413	$20,622,308	*$1,992,895*	*10%*
Payments to other companies in excess of receipts from such companies for hire of equipment and use of joint facilities	1,101,266	1,558,170	*456,904*	*29%*
Net Railway Operating Income	$13,372,055	$17,924,982	*$4,552,927*	*25%*
Income from investments in securities, property rentals and other items	1,994,182	2,014,800	*20,618*	*1%*
Miscellaneous income deductions	526,126	570,768	*44,642*	*8%*
Gross Income before deductions for fixed charges	$14,840,111	$19,369,014	*$4,528,903*	*23%*
Fixed charges — interest on funded debt, rentals paid for leased railroads, etc.	7,398,522	7,547,703	*149,181*	*2%*
Net Income available for dividends and other corporate purposes	$7,441,589	$11,821,311	*$4,379,722*	*37%*
Percentage of each dollar of operating revenue consumed by operating expenses	71.41%	64.75%	6.66%	
Rate of return on investment in property used for transportation service	2.94%	3.93%	*.99%*	
Times fixed charges earned	2.01	2.57	*.56*	
Earnings per share of First and Second Preferred Stock	$5.32	$8.44	*$3.12*	
Earnings per share of Common Stock after First and Second Preferred dividend requirements of $2.00 per share each	$3.32	$6.44	*$3.12*	

Italics denote decreases.

Financial Position, December 31st.

	1944	1943	Increase or *Decrease*
Investments in land, railroad tracks, terminal facilities, shops, locomotives, freight and passenger cars and other fixed property of	$387,648,398	$367,022,442	$20,625,956
Investments in stocks, bonds and notes carried at	65,019,629	78,770,095	*13,750,466*
Total	$452,668,027	$445,792,537	$6,875,490
Temporary Cash Investments	$11,492,991	$9,254,259	$2,238,732
Total Investments	$464,161,018	$455,046,796	$9,114,222
Cash	$8,091,050	$13,903,960	*$5,812,910*
Due from railroad companies and others	12,652,995	9,836,302	2,816,693
Fuel, rails, ties, bridge material and other supplies necessary for keeping road and equipment in good repair	8,868,336	7,337,652	1,530,684
Special deposits, deferred assets and unadjusted debits	4,068,725	3,074,769	993,956
Total assets	$497,842,124	$489,199,479	$8,642,645
Owed for materials, supplies, wages and balances to other railroad companies, and interest and rents accrued but not yet due	$15,955,130	$13,986,257	$1,968,873
Taxes accrued but not due	17,759,546	20,266,405	*2,506,859*
Reserve for depreciation and amortization of road and equipment	98,401,711	92,481,658	5,920,053
Deferred liabilities and unadjusted credits	1,157,873	1,349,641	*191,768*
The total of these liabilities, credits and reserves was	$133,274,260	$128,083,961	$5,190,299
After deducting these items from the total assets there remained capital net assets of	$364,567,864	$361,115,518	$3,452,346
The Capitalization consisted of the following:			
Funded Debt, including bonds, equipment obligations, etc.	$106,686,233	$105,854,295	$831,938
First Preferred Stock	27,991,150	27,991,150	.....
Second Preferred Stock	41,970,600	41,970,600	.....
Common Stock	69,989,100	69,989,100	.....
Making a total capitalization of	$246,637,083	$245,805,145	$831,938
After deducting this capitalization from net assets there remained a corporate surplus of	$117,930,781	$115,310,373	$2,620,408

Italics denote decreases.

The Company earned $115,793,963 from transportation services—the greatest gross operating revenues it has ever enjoyed—an average of $82,228 per mile of road operated. Freight revenues averaged 1.077¢ per ton per mile.

The results in 1944, as in 1943, in many respects surpassed those of any other year in the Company's history, as illustrated by the following table:

	1944	1943	Comparison of 1944 with earlier years
Freight:			
Anthracite Coal—			
Tons—			
Prepared	15,502,931	14,397,312	Highest since 1918
Unprepared	14,748,739	13,280,644	All time high
Revenue	$22,423,256	$20,691,226	Highest since 1923
Bituminous Coal—			
Tons	25,507,763	23,739,802	All time high
Revenue	$19,987,900	$20,485,194	Highest since 1926, except 1943
Merchandise—			
Tons	43,411,215	45,940,518	All time high, except 1943
Revenue	$57,779,648	$57,210,531	All time high
Total—			
Tons	99,170,648	97,358,276	All time high
Revenue	$100,190,804	$98,386,951	All time high
Tons carried one mile	9,302,819,932	9,222,955,350	All time high
Passenger:			
Number	24,322,092	23,588,722	Highest since 1926
Revenue	$10,431,501	$10,068,124	Highest since 1923
Per passenger per mile	1.926¢	1.929¢	Highest since 1932, except 1943
Passengers carried one mile	541,485,825	521,864,350	All time high

The Company was required to pay increased costs in performing service to the public. Normal increases were incurred with the handling of a greater volume of business. Costs were disproportionately increased by rising prices of materials (notably, steel, ties and coal) and of labor, all of which are largely regulated by the Government. Wage awards paid during the year as a result of Government direction were $4,959,497, and, due to scarcity of manpower, a considerable amount of overtime wages was paid.

Both road and equipment were adequately maintained for safe and efficient operation, but wear and tear from increased use in handling war-time business is taking its toll on service life.

The total tax bill in 1944 was $19,194,374, which in the past five years was exceeded only by the tax bill last year.

The funded debt of Reading Company held by the public on December 31, 1944, compared with December 31, 1943, was as follows:

	December 31, 1944	December 31, 1943	Increase or *Decrease*
Mortgage Bonds	$94,599,063.94	$87,645,868.11	$6,953,195.83
Collateral Trust Bonds	11,755,000.00	12,839,000.00	*1,084,000.00*
Equipment obligations	236,000.00	708,000.00	*472,000.00*
	$106,590,063.94	$101,192,868.11	$5,397,195.83

The increase of $5,397,195.83 resulted from the assumption of $6,950,000 First Mortgage Serial and Sinking Fund Bonds and $12,695.83 miscellaneous real estate obligations of The Philadelphia and Reading Terminal Railroad Company, which Company was merged into Reading Company on August 10, 1944, less $1,565,500 of Reading Company obligations which were cancelled or acquired for investment. The assumption of the debt of the Terminal Company did not increase Reading Company's annual fixed charges, as it was paying the Terminal Company a rental which provided for the annual interest on the assumed obligations.

R. W. BROWN, *President.*

his opinion that the use of posts in the present case "was solely for the purpose of repairing the respondents' tracks," and thus the cost of making such repairs "should not be charged to capital account."

"Nothing," he said, "is more clear in the record than the fact that the respondents have no additional facilities after the work is performed nor that only existing facilities have been restored. Further, while there is no policy of law which discourages charges to capital account, unless clearly warranted, it is now and always has been the intent and express purpose of our classification of accounts to prevent the charge to capital account of expenditures which merely serve to maintain existing facilities in service without increase in the amount or capacity thereof."

The evidence of record showed that from 1937 to 1943 the T. & P. spent $682,393 for the driving of 1,328,945 posts. In all about 189 miles of its line have been covered. Between 1939 and 1943 the L. & A. had driven 1,062,498 posts at a total cost of $393,522, covering about 151 miles of track. The T. & N. O. has been doing such work since 1931, "but the extent thereof is not shown," although the March, 1941-to-May, 1942, expenditures were put at $44,165.

Study Lasting Inter-American Transportation Committee

One proposal to be studied by an international Technical Economic Conference which is scheduled to meet in Washington, D. C., in June is a recommendation of the recent Inter-American Conference at Mexico City that a permanent inter-American group of technical transportation specialists be established for the development and integration of the transportation systems of this hemisphere, according to the Office of Inter-American Affairs.

The Mexico resolution declared that improvement, extension and linking together of all classes of transportation to provide safe, adequate and efficient service at reasonable cost are "essential for the realization of sound economic development plans and for the raising of levels of living of the American peoples."

Container Bureau Bulletins Are Printed in Spanish

Because damage resulting from container breakage has been increasingly frequent in the past two years in the movement of tomatoes from Mexico and Cuba to destinations in the United States and Canada, the Association of American Railroads, with the cooperation of the Southern Pacific of Mexico, the National Railways of Mexico, and the Cuban roads, has recently distributed to packing houses and other shipping points in the two countries bulletins in Spanish which explain proper methods of assembling lug boxes and tell how they should be loaded, stripped and braced in freight cars.

Shipments of tomatoes into the United States from the west coast of Mexico, through Nogales, Ariz., are expected to total 5,000 or 6,000 carloads this year. An additional 1,200 to 1,500 carloads are expected to come through Laredo, Tex., from the east coast of Mexico. The volume of rail movement of Cuban tomatoes has been affected by war conditions, as much of this traffic was handled by boat and short-haul truck in normal times.

(Left to Right): W. M. Jeffers, President of the Union Pacific, Edgar Kobak, President of the Mutual Broadcasting System, and Dr. C. C. Criss, President of the Mutual Benefit Health & Accident Assn., at a Meeting of the Omaha (Neb.) Advertising Club. The U. P. Sponsors the "Your America" Series Over Mutual, with Railroad Employees Participating.

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Another circular, also printed in Spanish, has been distributed to shippers of pineapples in Cuba through the Cuban railroads and importers. This gives the specifications of the standard pineapple box. In normal times relatively little breakage trouble was experienced in this movement, it was explained, but wartime use of second-hand and poorly nailed containers has led to a sharp increase in breakage.

The circulars were prepared by the A. A. R. Freight Container Bureau.

February Truck Traffic

Motor carriers reporting to the American Trucking Associations, Inc., transported in February 1,941,391 tons of freight, a decrease of 5.4 per cent from the 2,051,662 tons reported for January and a decrease of 0.6 per cent from the February, 1944, total of 1,952,502 tons. The A. T. A. index, based on the 1938-1940 average monthly tonnage of reporting carriers, was 172.44, as compared to 185.94 in January.

The foregoing figures, according to the A. T. A. statement, are based on reports from 267 carriers in 45 states. Truckers in the Eastern district reported a decrease of 2.7 per cent below January but an increase of 0.3 per cent above February of the previous year. In the Southern region there was a decrease of 9.7 per cent below January and a decrease of 5.3 per cent below February, 1944. In the Western district the decreases reported were 8.8 per cent under January and 0.3 per cent below February, 1944.

Traffic Club of Chicago Elects Officers

At the annual meeting of the Traffic Club of Chicago held at the Palmer House on March 29, the following officers and directors were elected: President, J. H. Burke, vice-president and general manager, Chicago Tunnel Terminal Company and Chicago Tunnel Transport Company; first vice-president, R. V. Craig, general traffic manager, Allied Mills, Inc.; second vice-president, W. R. Cox, freight traffic manager, P. R. R.; third vice-president, Lee J. Quasey, commerce counsel, National Live Stock Producers' Association; secretary, Otis A. Green, western freight traffic manager, United States Lines; treasurer, R. J. Wallace, traffic manager, Jaques Manufacturing Company; members of the board of directors, S. L. Felton, general traffic manager, Acme Steel Company; David S. Mackie, freight traffic manager, New York Central; Arthur B. Murphy, general freight agent, Toledo, Peoria and Western; Donald H. Smith, vice-president, General American Transportation Corporation.

Money for Rivers and Harbors

President Roosevelt has signed H.R. 2126, the War Department Civil Functions Appropriation Bill for the fiscal year ending June 30, 1946, which carries in its final version $44,508,000 for rivers and harbors work, mostly for maintenance and operation of existing projects. Congressional action on the measure was completed March 21 when the Senate and House adopted the conference report on the differing Senate and House versions. The current year's appropriations for rivers and harbors work have totaled $54,124,000.

Emergency Boards

Chairman H. H. Schwartz of the National Railway Labor Panel has appointed an emergency board from the panel to investigate a dispute between the Atlantic Coast Lines and certain of its employees represented by the Brotherhood of Railway Clerks. The dispute involves working rules and demands of the employees for changes in paid-vacations and sick-leave arrangements.

Members of the board are Frank M. Swacker, attorney of New York, Norman J. Ware, industrial relations consultant of Hartford, Conn., and Walter Gilkyson, attorney of New Hartford, Conn.

President Roosevelt has received the report of the emergency board he created on March 7 to investigate the wage controversy which brought a strike threat to the Des Moines & Central Iowa. The employees involved were represented by the Brotherhood of Locomotive Engineers and the Brotherhood of Railroad Trainmen; and the board reported that a settlement of the controversy had been achieved.

Assistant Commerce Secretary Plugs for Airport Subsidies

There is urgent need for immediate, extensive airport planning as an important factor in developing the great potentialities of civil aviation, according to an article appearing in the April issue of "Domestic Commerce," monthly publication of the Department of Commerce. The author is William A. M. Burden, assistant secretary of commerce.

"We are now reaching the point," he said, "where civil aviation is important enough in the national economy to have its needs for public airport facilities considered on their own merits. In the years just ahead, aviation must assume a position beside rail, water and road systems as a widely accepted means of transportation. Yet, no part of the aviation picture has been the subject of more conflicting re-

ports and confusing statements than have been airports.

"A great many people are under the impression that Federal aid for airport development is available now. At present there are no funds available to the Civil Aeronautics Administration for civil airport construction, and the only assistance the C. A. A. can give to further the National Airport Plan which the C. A. A. drew up at the request of Congress, is to render advice on airport planning, site selection, and airport operational and management problems."

Charge Anti-Trust Suit is Itself Law Violation

Attorneys for the Western Association of Railway Executives and the Association of American Railroads asserted in a brief filed in U. S. District Court at Lincoln, Neb., last week, that commencement of the Department of Justice's anti-trust suit against the two associations, 47 western railroads and 89 individuals, was in itself a violation of the law and in defiance of an act of Congress.

The brief was in support of motions filed with the court last January asking dismissal of the anti-trust action which Attorney General Biddle brought against the railroads in August, 1944.

The brief placed emphasis on the passage by Congress June 11, 1943, of Public Law No. 603, and particularly Section 12, under which the chairman of the War Production Board was authorized to exempt from anti-trust prosecution industries engaged in functions requisite to winning the war through issuance of a certificate after consultation with the attorney general.

Prior to the passage of this law the Department of Justice had instituted grand jury proceedings at Chicago in an attempt to outlaw the long accepted conference method of making freight rates. This action was withdrawn at the request of the War and Navy departments.

B. & O.'s Post-War Committee Completes Six Studies

In formulating plans for the post-war period, the Baltimore & Ohio 16 months ago formed a seven-man committee on Post-War Traffic Development, headed by Douglas C. Turnbull, Jr., executive assistant. The findings of this group to date now appear in six brochures recently completed, with two more studies still under way. All are intended for President R. B. White and other general officers of the company.

While the contents of the reports are largely confidential, they are related directly to railroad traffic—its development; new equipment and materials; influence on traffic of manufacturing changes and new products; and new training technique and methods, job evaluation, personnel, public and industrial relations.

The work of this committee is given some little display in the March issue of the Baltimore & Ohio magazine, which points out that committee members are engaged not only in the post-war assignment but carry on all regular railroad duties as well. Committee members include John Hewes, Jr., superintendent, car service department; C. M. McKeen, manager, station operations; William E. Meuse, general passenger agent; T. C. Sparks, industrial engineer, freight traffic department; M. F. Steinberger, manager, highway transportation, operation and maintenance; and Edwin M. Talbot, special accountant, accounting and freight claims.

The committee meets in round-table session, and engages in discussion of books, pamphlets, speeches of industrial and governmental leaders, or news stories bearing on transportation or related topics. Past and present-day methods are studied, and frequently the committee receives suggestions from B. & O. officers and employees.

Chairman Turnbull discussed the workings of his committee at some length in the March 18, 1944, issue of *Railway Age*, page 565.

Objects to Extra Charge for Hell Gate Bridge Travel

An allegation of undue discrimination by the Pennsylvania, New York, New Haven & Hartford, and New York Connecting has been filed with the Interstate Commerce Commission by Wilbur E. Dow, Jr., and docketed as No. 29284. The basis of the complaint is the additional charge which the roads required him to pay, when traveling from Boston, Mass., to Newark, N. J., for transportation over the Hell Gate bridge route, as compared to the sum of the fares from Boston to New York and New York to Newark.

The complainant and his wife held first-class rail tickets and Pullman seat tickets from Boston to New York on a train which was scheduled to proceed by the Hell Gate bridge through Pennsylvania station, New York, and then through Newark. Upon arrival at Pennsylvania station, New York, the complainant did not leave the train, having discovered, he asserted, that the train continued through Newark. He paid the conductor the New York-Newark first-class rail ticket fare and Pullman seat fare, and in addition was required to pay, for two passengers, $1.98 additional compensation for transportation over the Hell Gate bridge route.

This charge of $1.98, the petition stated, was unduly discriminatory in that it was made for an act performed in the interest of the carriers concerned. The railroads were not entitled to additional compensation for the use of the bridge route, it argued, since the complainant already had passed over the bridge into the station without payment of any additional tariff, while no burden was put upon the Pennsylvania's terminal facilities in New York because he remained on the train. The only additional charge to which the roads were entitled for the use of the through route, the petition contended, was 5 cents per person, the subway fare for travel from Grand Central Terminal to Pennsylvania station.

Lake Season Opened March 25

Passage of two ships of Canadian registry through the straits of Sault Ste. Marie on March 25 marked the official opening of the 1945 season of navigation on the Great Lakes, the Office of Defense Transportation has pointed out. These ships, bound for Fort William, Ont., to take out grain consigned to lower lake ports, were moving without lading.

All indications are that the Great Lakes vessel fleet in 1945 will be called on to

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"Junior Club Car" of Tomorrow

In this most recent of its future passenger car designs, Pullman-Standard Car Manufacturing Company proposes a "fun house on wheels" where young travelers can be turned over to a trained stewardess for supervision on the trip's run. Not intended as a complete car, the above playland will occupy about 20 ft., or about one-fourth of the car's length, and will be used in conjunction with other types of accommodations. Amusements are diversified, including a slide, reached through a cave with concealed stairway; marionette show; man-in-the-moon with an electrical winking eye; kneeling sofas, giving youngsters a chance to see out the windows; writing desk, blackboard, books, games and toys

carry the biggest tonnage in history, according to Lawrence C. Turner, director of the O. D. T. Waterways Transport Department. A new record was set in 1944, despite the fact that ice delayed the opening of navigation until April 10.

March 25 is a relatively early date for opening the lake shipping season, which was opened on April 25 in 1943 and on March 26 in 1942. For several weeks vessels have been moving in Lake Erie and Lake Michigan, but the official opening of the season is determined by the first passage between the lower lakes and Lake Superior.

In compliance with an O. D. T. request, 10 of 36 over-age lake vessels that had been traded in on new construction will be made available for use on the lakes early this month, the War Shipping Administration has announced. The operation of these vessels will add 45,350 gross tons of shipping to the total available for the movement of ore, coal and grain on the lakes, it was explained. The O. D. T. has indicated that another request may follow for an additional 19 vessels of the same kind, to be ready for service about July 1.

Fluorescent Lighting Installed in C. P. R. Coach

The Canadian Pacific, on March 1, completed the overhauling of Coach 2169 in its Angus shops in which fluorescent lighting was applied. The coach was one of the last to be built since the war started and its shopping was required because of necessary repairs. The shopping period coincided with the receipt of a limited amount of lamps, plastics and a motor-generator set.

The car is lighted by thirty-six 14-watt, 15-in., T12 fluorescent lamps over the seats and fourteen 15-watt, 18-in., T8 lamps mounted on the surface of the ceiling for general lighting. The car has a seating capacity of 72 and there is a transversely mounted unit over each seat equipped with a plastic shade recessed into the underside of the parcel rack and an individual switch at the outer end of each fixture. The ceiling units are also transversely mounted. The lamps operate on 115 volts a.c. from a 1200-watt motor-generator set supplied by the Safety Car Heating & Lighting Co., New Haven, Conn. The motor-generator set in turn receives its power from a 30-volt gear-driven auxiliary generator.

The average lighting intensity on the 33-in., 45 deg. reading plane as taken at 20 locations is 5.7 footcandles.

Victorian Rys. Ask Control of Air Transport

Pointing out that the popularity of air travel for "inter-capital journeys" has already been established, and that post-war developments will no doubt include additional services for long trips between other large population centers, the report of the state-owned Victorian Railways for the year ended June 30, 1944, suggests that such developments on routes competitive with the railways "should not be fostered by subsidies, hidden or otherwise." It further adds that "just as harbor dues are levied against shipping, civil air services should bear a due proportion of the cost of ground and other facilities now provided at the public expense."

The railways' report urges that before plans for future air transport have been made definite, some form of adequate control be established, as has been the case with road transport, adding that "any body set up for this purpose should undoubtedly include representation of the railways as well as of the defense authorities."

Another section of the report deals with restrictions in services owing to the coal shortage. Passenger train-mileage in the year 1943-44 was curtailed to the point where it represented only 52 per cent of that remaining after the 1942 curtailment, and 44 per cent of the mileage prior to the reductions of 1942. Reservation of seats was abolished (except on interstate trains) and suburban services reduced, 10 per cent on week days and 50 per cent at other times. Heavy restrictions were placed also on freight and livestock. "Inevitably," the report goes on, "all the steps which were thus forced upon up by insufficient coal supplies resulted in inconvenience in one form or another to railway users." To combat opinion that war-time conditions represented a normal standard of railway travel, the Victorian Railways "endeavored by pamphlets and other publicity to counteract any such view."

Net revenue for the railways for the year 1943-44 amounted to £2,678,738 as compared with £3,001,282 in the 1942-43 period. This decrease, the report stated, was due mainly to changed conditions in the Pacific war zone, which led to a substantial decline in the volume of defense traffic, and to reduced passenger and freight service.

Freight Forwarder Insurance

The Interstate Commerce Commission has further postponed until May 1 the effective date of its order in the Ex Parte 159 proceedings, prescribing rules and regulations for freight forwarders in the matter of the filing of surety bonds, insurance policies, qualifications as self-insurer, or other securities.

Railway Express Manual Says Courtesy Catches Friends

Declaring public relations to be "everyone's job," the Railway Express Agency has distributed to its 75,000 employees a 20-page public relations manual.

Entitled "How Can We Do It Better?", the booklet according to K. H. Merritt, general manager, public relations, represents simply practices which Railway Express people "are constantly using," and seeks merely to "organize these things so as to give all of us the benefit of these experiences."

Each employee is reminded to be courteous, with the thought that in the post-

Recently Overhauled C. P. R. Coach

war period the "public will judge the merits of services rendered in the past as well as at the present." Pointing out that theirs is a highly specialized field requiring a knowledge of practices and facts, details, rules, regulations and procedures surrounding all operations of express transportation, the booklet asks that employees know the answers and "impart facts to others precisely and intelligently."

Amusing cartoon sketches are used throughout. Further reminders concern telephone technique, seven ways to success as an R. E. A. driver, and helpful suggestions for on-hand and receiving clerks.

A. C. L. Objects to Commission's Order

(*Continued from page 535*)

commission but not put in evidence." Therefore the road asked that the order be vacated, or, before the entry of any order adverse to it, that the issues be investigated by a formal hearing.

Taking up a discussion of the background of the order, the Coast Line pointed out that it would affect 2,084 miles of line; of this, however, 30 miles already is equipped with automatic block signals (Albany, Ga., to Darrow, 3 miles; Sanford, Fla., to Orlando, 24 miles; and Uceta, Fla., to Tampa, 3 miles). Figures were submitted showing the number of trains operated daily over each line on which the installation of signals would be required, both in 1944 and 1939. In determining whether the public interest requires the installation of signals, the road argued, the commission should view the matter in the light of the more nearly normal 1939 situation, and should not be influenced by the temporary conditions prevailing under the abnormal war traffic handled in 1944.

Normal Train Density Low—These figures showed, the reply said, that normally there is no such density of traffic over the portions of A. C. L. lines invalved as to justify installation of block signals. In 1939, it pointed out, only on 21.6 miles of this track (Haines City, Fla., to Lakeland) were there as many as 5 passenger trains operated each way daily. On the rest of the mileage, the maximum number of passenger trains operated daily in each direction in 1939 was as follows: On 31.1 miles, 4; on 422.3 miles, 3; on 821.7 miles, 2; on 493.4 miles, 1; on 294.6 miles, none. The freight trains operated, it said, were "correspondingly few."

Where the traffic density is as light as these data indicated, the road's "customary precautionary safety measures afford adequate protection from such accidents as the block signal system is designed to prevent," the reply stated. Moreover, it went on, the "primary purpose" of block signals is to facilitate the movement of trains. While they doubtless tend to promote safety, they are "far from effective" as a safety device, mainly because they depend largely on the "human element."

In 1944, with the heaviest traffic volume in its history, the Coast Line had 11 derailments and one collision on 835 miles of line equipped with automatic block signals, as compared to 12 derailments and 5 collisions on the 2,084 miles covered by the commission's order, most of which was not so equipped, according to the reply. What probably was the worst accidents in Atlantic Coast Line history, that at Rennert, N. C. (described in *Railway Age* of January 22, 1944, page 253), occurred, it pointed out, in automatic block signal territory.

On the line from Thomasville, Ga., to Dothan, Ala., 91 miles, on which the Whigham collision occurred, the road explained, that was the only collision in the 5-year period ended December 31, 1944. In the same period the only collision on the 111-mile line from Waycross, Ga., to Albany, except a minor grade crossing accident, was that at Acree referred to in the order.

Automatic vs. Manual—Turning to another aspect of the situation, the reply pointed out that installation of automatic block signals on all lines affected by the order would increase the road's property investment some $11,817,500, and its annual charges would be over $1,500,000 greater. Compliance with the order by establishing manual block operation would be less expensive so far as additional investment was concerned, but additional operating costs would be even greater, it stated. In addition, the manual block system is even less effective as a safety device than automatic signaling, it said, because of additional reliance on the human element.

The Coast Line argued further that it knew of no "formal case in which the commission has sought to exercise its authority to compel the carriers to install block signals." The provisions of section 25 of the act, and the extent of the commission's powers thereunder have not, it said, been the subject of judicial determination. "The carrier is not to be criticized for not having block signals when there is no public necessity therefor," it asserted.

The question of what safety measures a railroad should adopt, it went on to say, is essentially a matter of managerial discretion. If it fails in its duty to the public, the commission may step in. But, under the 1937 amendment to the act, the commission "cannot confine itself to the bare question whether this or that safety device tended to promote safety of operation. The criterion to be applied is that of the controlling public interest." It must not only be "consistent" or "compatible" with the public interest, it must be "necessary to" the public interest.

The commission, the Coast Line then contended, could not here make a finding of necessity in the public interest. The national transportation policy set forth in the Transportation Act of 1940, it said, requires "avoidance of waste" as well as "maintenance of service" to be considered in resolving matters of public interest. Because no finding of this character has been made, the road argued, the order should be vacated, or a formal investigation should be made.

Short Line Association Opens Chicago Office

The American Short Line Railroad Association on April 2 opened a Chicago office at 39 South La Salle street. The office is in charge of W. R. Grimm, traffic manager, who will have jurisdiction over traffic matters pertaining to the Association's Western, Southwestern, and Pacific regions, which coincide with Western Classification Territory. Mr. Grimm was formerly assistant traffic manager at Atlanta, Ga.

Freight Car Loading

Loadings of revenue freight for the week ended March 31 totaled 835,226 cars, the Association of American Railroads announced on April 5. This was an increase of 19,168 cars, or 2.3 per cent, above the preceding week, an increase of 49,120 cars, or 6.2 per cent, above the corresponding week last year, and an increase of 63,124 cars, or 8.2 per cent, above the comparable 1943 week.

Loading of revenue freight for the week ended March 24 totaled 816,058 cars, and the summary for that week, as compiled by the Car Service Division, A. A. R., follows:

Revenue Freight Car Loading

For the Week Ended Saturday, March 24

District	1945	1944	1943
Eastern	163,805	157,966	162,877
Allegheny	181,882	170,967	178,736
Pocahontas	54,304	54,874	57,434
Southern	131,982	122,051	121,386
Northwestern	84,533	85,001	81,209
Central Western	125,355	117,961	117,690
Southwestern	74,197	68,758	68,008
Total Western Districts	284,058	271,720	266,907
Total All Roads	816,058	777,578	787,340
Commodities			
Grain and grain products	45,822	43,261	44,979
Live stock	15,668	14,491	13,740
Coal	167,063	168,018	179,702
Coke	14,935	14,266	15,192
Forest products	39,604	43,588	41,687
Ore	17,877	14,492	18,279
Merchandise l.c.l.	110,214	106,716	99,952
Miscellaneous	404,875	372,746	373,809
March 24	816,058	777,578	787,340
March 17	815,789	785,195	768,134
March 10	766,290	780,265	769,045
March 3	785,264	786,893	748,926
February 24	771,843	780,984	782,921
Cumulative Total, 12 Weeks	9,234,642	9,442,747	9,039,808

In Canada.—Car loadings for the week ended March 24 totaled 67,122, as compared with 68,313 for the previous week and 69,745 for the corresponding period last year, according to the compilation of the Dominion Bureau of Statistics.

Total for Canada	Total Cars Loaded	Total Cars Rec'd from Connections
Mar. 24, 1945	67,122	38,646
Mar. 25, 1944	69,745	36,299
Cumulative Totals for Canada:		
Mar. 24, 1945	781,532	440,971
Mar. 25, 1944	816,168	477,527

Club Meetings

The New England Railroad Club will next meet at 6:30 p.m., April 10, at Hotel Vendome, Boston, Mass. F. J. Wall, vice-president, New York, New Haven & Hartford will present a paper on "Coordinated Transportation in New England."

When the Eastern Car Foremen's Association meets April 13, A. H. Keys, assistant superintendent car department, Baltimore & Ohio, will discuss the "Responsibility for Proper Loading of Freight Cars." The meeting will be held at 8 p.m., at 29 West 39th street, New York City.

Equipment and Supplies

Army Releases Steel for 2,000 More Box Cars

A direct transfer of carbon steel from the Army to the Office of Defense Transportation will enable the production of 2,000 additional new box cars in the first nine months of 1945, the O. D. T. has announced.

The Army has turned over 34,000 tons of carbon steel for the second quarter of 1945, the O. D. T. said, bringing the total box car production for the first nine months of 1945 to the "desired goal" of 20,000.

Col. J. Monroe Johnson, O. D. T. director, said that the railroads have placed orders for all these new cars. He expects the cars to be in service by October, in time for the heavy grain movement due at that time. In addition, they will also place the railroads in a better position to handle the increased freight traffic to the west coast called for by huge shipments of war materials to the Pacific theater.

The action of the Army, Colonel Johnson said, indicates a recognition on its part of the importance of the box car program as an essential feature of the war effort.

LOCOMOTIVES

The NATIONAL RAILWAYS OF MEXICO has placed an order with the Baldwin Locomotive Works for 16 steam, 4-8-4 locomotives, and has placed a similar order with the American Locomotive Company. The road has also ordered seven Diesel-electric units from the Electro-Motive division of the General Motors Corporation. The latter units will be used in mountain territory.

SIGNALING

The WABASH has placed an order with the Union Switch & Signal Co. for signal material required for an installation of manual block remote control signaling between Clapper, Mo., and Hannibal, 28.5 miles of single track. A new section will be added to the present Moberly-Clapper control machine to handle this territory from the control point at Moberly. The order includes the necessary office and field coding units, Style H-2 searchlight high signals, coded track circuit equipment for installation between sidings, switch circuit controllers, relays, rectifiers, transformers and housings. The installation work will be handled by the railroad company's construction forces.

The CHICAGO, BURLINGTON & QUINCY will install 57 miles of centralized traffic control between Flag Center, Ill., and Savanna, on its main line between Chicago and the Twin Cities at an estimated cost of $425,000. Completion of this project will give the Burlington either multiple tracks or centralized traffic control on the entire distance between Chicago and St. Paul, Minn. The Burlington already has multiple tracks between Chicago and Aurora, Ill., centralized traffic control between Aurora and Steward Junction, Ill., double track and centralized traffic control between Steward Junction and Flag Center, and double track between Savanna and St. Paul.

Supply Trade

A fifth renewal of the Army-Navy "E" has been awarded to two **Lodge & Shipley Machine Tool Co.** plants in Cincinnati, Ohio, for continued production achievement.

O. A. Wallace, who recently resigned as superintendent of the car department of the Atlantic Coast Line, with headquarters at Wilmington, N. C., has been appointed sales engineer of the **Enterprise Railway Equipment Company,** Chicago.

Preco, Inc., has recently opened district offices at 135 South LaSalle Street, Chicago, and 70 East 45th Street, New York. The branch offices will be in charge of **Paul H. Montgomery** and **Horace M. Wigney** respectively.

A. H. Keetch has been appointed head of the newly organized sales-service department of the **Warner & Swasey Co.**, Cleveland, Ohio, after a two years' leave of absence on government service. In Washington, Mr. Keetch served as chief of the priorities and distribution branch, tools division, War Production Board.

Ernest Murphy, vice-president in charge of operations, has been elected president of the **Pressed Steel Car Company** to succeed **John F. MacEnulty,** who becomes vice-chairman of the board of directors. The sales department will continue under the direct jurisdiction of Mr. MacEnulty.

David F. Robinson, recently granted inactive status from his assignment as lieutenant commander in the Navy Department, has joined **Harrington-Wilson-Brown Company,** with headquarters in New York City, effective March 1. Prior to entering the service, Mr. Robinson had been associated for 13 years with William Sellers & Company, Philadelphia.

Harry Holiday has resigned as manager of the Butler, Pa., division of the **American Rolling Mill Company** because of illness. **Gordon Gage,** formerly general superintendent, has been appointed to succeed Mr. Holiday and **Roy P. Tooke,** assistant chief of the company's general engineering department in Middletown, Ohio, has been transferred to Butler as general superintendent.

Milton Strauss has been elected president and treasurer of the **Boss Bolt & Nut Co.,** Chicago, a division of the Lock Nut Corporation of America. **Mr. Strauss** recently purchased the controlling interest in the company. **C. J. Johnson,** secretary since 1927, has been re-elected to that position and appointed assistant treasurer and **George S. Hubbard** has been elected vice-president and appointed sales manager, a position he previously held for four years.

Edward J. Guck of Detroit, Mich., for a number of years a production specialist and operator of his own plants, has been appointed general manager in charge of production.

J. R. Graham, formerly connected with the maintenance of way department of the Illinois Central at Chicago, has been appointed field manager of the Railway Equipment division of the **Nordberg Manufacturing Company,** with headquarters at Chicago. Mr. Graham will supervise technical service of the company's track maintenance tools, succeeding **W. W. Fitzpatrick,** deceased.

M. T. Deames, who has been with the **Caterpillar Tractor Company,** Peoria, Ill., since 1929, has been appointed assistant general parts manager. The following men have been appointed to assist Mr. Deames as parts managers: **A. H. Yingst,** for export and government sales; **T. H. Hodgins,** for the central sales division; **C. M. McKnight,** for the western sales division, and **B. W. Kramm** for the eastern sales division. **E. L. Mason, H. F. Haven,** and **C. D. Byrns** have been appointed assistant parts managers of the central, western and eastern sales divisions respectively.

Henry G. MacDonald has been promoted to assistant vice-president of the **Pullman-Standard Car Manufacturing Company,** with headquarters in New York as heretofore. Mr. MacDonald was graduated from Cornell University. He was with the Standard Steel Car Company from 1902 to 1930, rising from sales engineer to assistant to the vice-president. He was appointed assistant secretary of Pullman-Standard when that company was formed through the merger of the Standard Steel Car Company and the Pullman Car & Manufacturing Co., in 1930.

Frederick H. Norton has been appointed assistant vice-president in the **American Car & Foundry Co.'s** sales department with headquarters in New York. Mr. Norton attended the Morgan Park Military Academy, Chicago, from 1920 to 1924, and during this period worked part time for the Union Metal Products Company, now the Standard Railway Eqiupment Company. He later was employed by the Union Metal Products Company, first as office boy and then as draftsman, meanwhile attending night school and being graduated in 1928. He was graduated from Purdue University in 1932 with a degree in mechanical engineering and subsequently was employed as sales engineer by the A. L. Jackson Company. He joined the Chicago office of the American Steel Foundries as sales engineer assigned to mid-western railroads in 1934 and in May, 1940, he was appointed war production engineer and assigned to Washington, D. C., to handle all of the American Steel Foundries' activities with the government and foreign agencies.

OBITUARY

Alexander Turner, vice-chairman and director of the National Bearing Metals Corporation, died March 20. He was 77 years of age. Mr. Turner was employed

with the Wisconsin Central from 1886 to 1899, as a locomotive fireman, traveling fireman, locomotive engineman and road foreman of engines. He next was employed with the Galena Signal Oil Company from 1899 to 1909. He served as vice-president of the Bronze Metal Company from 1913 to 1927. He was elected vice-chairman and director of the National Bearing Metals Corporation in 1927.

Financial

ANN ARBOR.—*Annual Report.*—The 1944 yearly statement of this road shows a net income after interest and other charges of $423,121 as compared with $508,565 in 1943. Selected items from the income statement follow:

	1944	Increase or Decrease Compared With 1943
Average Mileage Operated	293.86	.....
RAILWAY OPERATING REVENUES	$5,946,354	-$90,533
Maintenance of way and structures	732.256	+131,626
Maintenance of equipment	1,042,077	+88,137
Transportation—rail line	2,442,561	+125,274
TOTAL OPERATING EXPENSES	4,561,260	+352,887
Operating ratio	76.71	+7.0
NET REVENUE FROM OPERATIONS	1,385,094	-443,420
Railway tax accruals	681,907	-306,493
RAILWAY OPERATING INCOME	703,187	-136,927
Net rents—Dr.	37,863	-28,261
NET RAILWAY OPERATING INCOME	665,324	-108,666
Other income	23,349	+960
GROSS INCOME	688,673	-107,706
Rent for leased roads	.....	-9,177
Interest on funded debt	260,808	-11,593
TOTAL FIXED AND OTHER CHARGES	265,552	-22,262
NET INCOME	423,121	-85,444

BANGOR & AROOSTOOK.—*Annual Report.*—The 1944 annual statement of this road shows a net income, after interest and other charges of $947,421 as compared with a net income of $1,221,745 in 1943. Selected items from the income statement follow:

	1944	Increase or Decrease Compared With 1943
RAILWAY OPERATING REVENUES	$10,024,676	+$1,319,803
Maintenance of way and structures	1,567,685	+218,559
Maintenance of equipment	1,509,479	+228,654
Transportation	2,514,281	+329,826
TOTAL OPERATING EXPENSES	6,065,812	+784,756
Operating ratio	60.51	-0.16
NET REVENUE FROM OPERATIONS	3,958,864	+535,047
Railway tax accruals	2,737,973	+842,611
RAILWAY OPERATING INCOME	1,220,891	-307,564
Net rents—Cr.	234,424	-27,280
NET RAILWAY OPERATING INCOME	1,455,316	-334,843
Total other income	65,609	+2,811
TOTAL INCOME	1,520,925	-332,033
Interest on funded debt	560,373	-51,096
FIXED CHARGES	568,275	-53,670
NET INCOME	947,421	-274,324

BOSTON & MAINE.—*R. F. C. Sells Securities*—The Reconstruction Finance Corporation has announced the sale to the First Boston Corporation of $10,000,000 principal amount of its holdings of this road's 4 per cent series RR first mortgage bonds at 103, the premium to the R. F. C. on the transaction being $300,000.

CHATTAHOOCHEE VALLEY.—*Promissory Note.*—This road has applied to the Interstate Commerce Commission for authority to issue a $100,000 promissory note for a bank loan, the proceeds of which are to be employed, with other funds, to pay the balance due on a 5-year note, originally in the amount of $330,000, which was issued to redeem bonds. The loan is to be obtained from the Trust Company of Georgia, Atlanta, Ga., at 2½ per cent.

CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC.—*R. F. C. Debt Retired.*—Fred M. Vinson, Federal Loan Administrator, announced March 31 that this road had retired the balance of its indebtedness to the Reconstruction Finance Corporation by a payment of $10,442,827 plus interest. The R. F. C. had advanced this road $11,500,000 prior to the institution of reorganization proceedings in June, 1935, and subsequently bought two issues of equipment trust certificates aggregating $8,762,000. It also had purchased from the Public Works Administration $3,948,000 of the road's securities. The equipment trust certificates were sold to investors at premiums to the R. F. C. amounting to $263,300.

DELAWARE & HUDSON.—*Annual Report.*—The 1944 annual statement of this road shows a net income, after interest and other charges, of $3,965,465 as compared with $8,004,630 in 1943. Selected items from the income statement follow:

	1944	Increase or Decrease Compared With 1943
Average Mileage Operated	846.33	-1.52
RAILWAY OPERATING REVENUES	$50,484,717	+$2,334,583
Maintenance of way and structures	6,025,387	+752,448
Maintenance of equipment	12,715,412	+983,291
Transportation	17,135,354	+1,468,253
TOTAL OPERATING EXPENSES	37,839,777	+3,286,670
Operating ratio	74.95	+3.19
NET REVENUE FROM OPERATIONS	12,644,940	-952,087
Railway tax accruals	3,741,001	+1,204,111
Equipment rents—Net Cr.	160,663	-95,387
Joint facility rents—Net Dr.	216,342	+32,616
NET RAILWAY OPERATING INCOME	8,848,260	-2,284,201
Total other income	623,089	+16,174
TOTAL INCOME	9,471,348	-2,268,027
Rent for leased roads	1,731,221	-1,750
Interest on funded debt	1,263,104	-764,895
TOTAL INTEREST AND LEASED LINE RENTALS	4,581,127	-770,067
NET INCOME	3,965,465	-4,039,165

ILLINOIS CENTRAL.—*Line Revision.*—This company and its subsidiary, the Chicago, St. Louis & New Orleans, have applied to the Interstate Commerce Commission for authority to operate and to acquire, respectively, a 5.43-mile segment of line in the vicinity of Gilbertsville, Ky., which the Tennessee Valley Authority has built in lieu of existing trackage which will be abandoned in connection with the construction of a Tennessee river dam at that point.

INDIANA HARBOR BELT.—*Annual Report.*—The 1944 yearly statement of this road shows a net income after interest and other charges, of $748,169 as compared with net income of $608,254 in 1943. Selected items from the income statement follow:

	1944	Increase or Decrease Compared With 1943
Average Mileage Operated	124.36	.....
RAILWAY OPERATING REVENUES	$16,281,505	-$453,305
Maintenance of way and structures	1,801,117	+239,515
Maintenance of equipment	2,522,077	+680,829
Transportation	8,764,904	+273,277
TOTAL OPERATING EXPENSES	13,715,862	+908,962
Operating ratio	84.24	+7.71
NET REVENUE FROM OPERATIONS	2,565,643	-1,362,267
Railway tax accruals	1,015,445	-478,353
RAILWAY OPERATING INCOME	1,550,198	-883,914
Equipment rents—Net Dr.	797,394	-217,236
Joint facility rents—Net Dr.	253,049	-96,543
NET RAILWAY OPERATING INCOME	499,756	-570,135
Total other income	1,349,143	+1,270,541
TOTAL INCOME	1,848,905	+700,406
Rent for leased roads and equipment	105,541	+948
Interest on funded debt	389,500	.....
TOTAL FIXED CHARGES	583,923	+80,472
NET INCOME	748,169	+139,915

LEHIGH & HUDSON RIVER.—*Annual Report.*—The 1944 yearly statement of this road shows a net income, after interest and other charges, of $313,898, as compared with $309,784 in 1943. Selected items from the income statement follow:

	1944	Increase or Decrease Compared With 1943
RAILWAY OPERATING REVENUES	$3,109,505	+$66,028
Maintenance of way and structures	579,171	+27,604
Maintenance of equipment	443,745	+78,446
Transportation	924,165	+57,992
TOTAL OPERATING EXPENSES	2,094,848	+171,758
Operating ratio	67.4	+4.2
NET REVENUE FROM OPERATIONS	1,014,657	-105,730
Railway tax accruals	497,871	-99,973

Hire of equipment	132,769	−15,171
Joint facility rents	95,596	+5,342
NET RAILWAY OPERATING INCOME	288,421	+4,072
Non-operating income	26,971	+858
GROSS INCOME	315,392	+4,930
TOTAL DEDUCTIONS FROM GROSS INCOME	1,494	+816
NET INCOME	313,898	+4,115

LOUISIANA & ARKANSAS.—*Trackage Agreement.*—This road has asked the Interstate Commerce Commission for approval of a new agreement covering its lease of a Missouri Pacific branch from Wildsville, La., to Concordia Junction, 14.7 miles, and its operation under trackage rights over a line of the same road from Concordia Junction to Vidalia, 8.32 miles.

MAINE CENTRAL.—*Annual Report.*—During 1944, freight revenue of the Maine Central amounted to $15,058,460, an increase of 8.3 per cent over 1943 and the highest in the company's history, and passenger revenue amounted to $3,973,146, an increase of 10.92 per cent over 1943 and the highest since 1924. Tax accruals were $2,574,750, an increase of 2.4 per cent compared with 1943. "This amount is $114,543 more than the company's income available for fixed charges," the annual report states. "In considering the limits of net income imposed by the reduction of the excess profits tax credit from 6 per cent to 5 per cent on all invested capital over $10,000,000, it must be remembered that the income below this ceiling is subject to an income tax of 42 per cent, so that in actual effect the federal tax takes 95 per cent of practically all net income over 3 per cent on invested capital. From this meager return on investment must come the funds required for sinking funds and other corporate purposes before any return to stockholders." The state of Maine excise tax in 1944 was $596,265.

The road's unmatured funded debt at December 31, 1944, the report shows, amounted to $25,719,000, a decrease of $1,176,000 below the debt at the end of 1943. Of this total, $1,144,400 is owned by the company.

MINNEAPOLIS & ST. LOUIS.—*Promissory Notes.*—This company has applied to the Interstate Commerce Commission for authority to issue $607,233 of promissory notes in evidence, but not in payment, of indebtedness under a conditional sale agreement for the purchase from the Electro-Motive Division of General Motors Corporation of two 4,050-hp. Diesel-electric freight locomotives at an aggregate cost of $759,520.

NEW YORK, NEW HAVEN & HARTFORD.—*Reorganization.*—The Pennsylvania has asked the Interstate Commerce Commission to hold a further hearing in its Finance Docket 10992 proceeding, which has to do with a plan for reorganization of the New Haven, in order to bring the record up to date as to changes in the debtor's financial position since the conclusion of earlier hearings and also in order to consider further financial changes that may occur. The Pennsylvania expressed the view that the commission must hold further hearings, inasmuch as the plan of reorganization which it proposed has been referred back to it by the court. Subsection (d) of section 77 of the Bankruptcy Act requires this procedure, it said.

NEW YORK, ONTARIO & WESTERN.—*Annual Report.*—The 1944 yearly income account of this road shows a net deficit, including interest and other charges, of $2,947,253, as compared with a net deficit of $1,736,794 in 1943. Selected items from the income account follow:

	1944	Increase or Decrease Compared With 1943
RAILWAY OPERATING REVENUES	$9,244,351	+$557,551
Maintenance of way and structures	1,142,480	+42,381
Maintenance of equipment	1,844,349	+166,028
Transportation—rail line	5,329,351	+1,179,987
TOTAL OPERATING EXPENSES	8,915,107	+1,349,789
Operating ratio	96.44	87.09
NET REVENUE FROM OPERATIONS	329,245	−792,237
Railway tax accruals	590,301	+130,911
RAILWAY OPERATING INCOME—Dr.	261,057	−923,150
Net rents—Dr.	728,037	+275,033
Joint facility rents	57,862	−5,567
NET RAILWAY OPERATING INCOME—Dr.	209,089	−1,198,182
Total other income	43,508	+6,986
TOTAL INCOME—Dr.	945,585	−1,191,195
Rent for leased roads and equipment	30,412	−322
Interest on funded debt	1,250,128	+35,971
TOTAL FIXED CHARGES	1,314,440	−4,954
NET DEFICIT	2,947,253	+1,736,794

NORFOLK SOUTHERN.—*Annual Report.*—The 1944 annual statement of this road shows a net income, after interest and other charges, of $304,414, as compared with a net income of $507,341 in 1943. Selected items from the income statement follow:

	1944	Increase or Decrease Compared With 1943
Average Mileage Operated	727.1	−5.61
RAILWAY OPERATING REVENUES	$8,221,894	−$155,682
Maintenance of way and structures	1,922,146	+140,460
Maintenance of equipment	994,603	+3,309
Transportation	2,870,594	+195,820
TOTAL OPERATING EXPENSES	6,464,510	+282,856
Operating ratio	78.63	+4.84
NET REVENUE FROM OPERATIONS	1,757,384	−438,538
Railway tax accruals	722,109	−176,709
RAILWAY OPERATING INCOME	1,035,275	−261,829
Net rents, equipment and joint facility—Net Dr.	352,430	+1,379
NET RAILWAY OPERATING INCOME	682,845	−260,450
Total other income	227,235	+28,197
TOTAL INCOME	910,081	−232,253
Rent for leased roads	76,250	+3,750
Interest on funded debt	209,598	−16,914
TOTAL FIXED CHARGES	285,898	−14,019
NET INCOME	304,414	−202,928

RUTLAND.—*Annual Report.*—The 1944 annual report of this road shows a net deficit, after interest and other charges of $319,189, as compared with a net income of $113,844 in 1943. Selected items from the income statement follow:

	1944	Increase or Decrease Compared With 1943
Average Mileage Operated	407.29	.....
RAILWAY OPERATING REVENUES	$5,086,697	+$375,790
Maintenance of way and structures	730,107	+80,007
Maintenance of equipment	1,066,450	+141,664
Transportation—rail line	2,622,064	+351,462
TOTAL OPERATING EXPENSES	4,753,306	+608,832
Operating ratio	93.45	87.98
NET REVENUE FROM OPERATIONS	333,390	−233,043
Railway tax accruals	317,403	+24,823
RAILWAY OPERATING INCOME	15,988	−257,865
Equipment rents—Net Dr.	45,136	−58,223
Joint facility rents—Net Cr.	32,998	−7,010
NET RAILWAY OPERATING INCOME	3,851	−323,098
Other income	85,263	−109,798
TOTAL INCOME	89,113	−432,896
Rent for leased roads	15,000	.....
Interest on funded debt	386,095	.....
TOTAL FIXED CHARGES	401,135	−6.43
NET DEFICIT	319,189	−433,033

TENNESSEE CENTRAL.—*Annual Report.*—The 1944 annual report of this road shows a net income after interest and other charges of $149,844, as compared with a net income of $480,208 in 1943. Selected items from the income statement follow:

	1944	Increase or Decrease Compared With 1943
Average Mileage Operated	285.7	.....
RAILWAY OPERATING REVENUES	$4,769,426	−$72,089
Maintenance of way and structures	1,005,488	−8,128
Maintenance of equipment	778,954	+103,777
Transportation	1,591,748	+142,416
TOTAL OPERATING EXPENSES	3,668,396	+232,693
Operating ratio	76.91	+5.95
NET REVENUE FROM OPERATIONS	1,101,030	−304,781
Railway tax accruals	518,799	−6,693
RAILWAY OPERATING INCOME	582,231	−298,088
Equipment rents—Net Dr.	198,925	+37,438
Joint facility rents—Net Dr.	6,599	+25
NET RAILWAY OPERATING INCOME	376,707	−335,552
Non-operating income	18,357	−4,300
GROSS INCOME	600,588	−302,388
Rent for leased roads and equipment	25,488	+379
Interest on funded debt	208,686	−3,457

News Department continued on next left-hand page

FOR PROFITABLE POST-WAR L.C.L. TRAFFIC

Post-war business will demand still faster freight transportation, and profitable L. C. L. traffic will require a delivery service that will outdistance motor competition.

For such "cannonball" service, modern motive power is a first essential. Locomotives must be capable of hauling heavy trains at sustained high speeds on long runs.

LIMA LOCOMOTIVE WORKS — LIMA LOCOMOTIVE WORKS INCORPORATED — INCORPORATED, LIMA, OHIO

Total Deductions from Gross Income	450,744	+27,976
Net Income Transferred to Profit and Loss	149,844	−330,364

Virginian.—*Refinancing.*—This company has applied to the Interstate Commerce Commission for authority to issue and sell $60,000,000 of series B 3 per cent first lien and refunding mortgage bonds due in 1995, and to issue nominally $9,544,000 of the same bonds. The proceeds of the sale, plus treasury funds and the proceeds of bank loans, are to be applied to the redemption at 106 of $60,044,000 of series A 3¾ per cent first lien and refunding mortgage bonds due in 1966, while the nominally issued new bonds will be exchanged for an equal principal amount of the series A bonds held in the road's treasury. Unsecured promissory notes not to exceed $3,000,000 will be issued, upon commission approval, for the bank loans.

Wabash.—*Annual Report.*—The 1944 annual statement of this road shows a net income, after interest and other charges, of $6,518,154, as compared with a net income of $8,758,574 in 1943. Selected items from the income statement follow:

	1944	Increase or Decrease Compared With 1943
Average Mileage Operated	2,393.36	−.11
Railway Operating Revenues	$94,701,127	−$819,420
Maintenance of way and structures	12,185,384	+1,601,345
Maintenance of equipment	11,471,145	+752,454
Transportation—rail line	29,468,794	+1,498,886
Total Operating Expenses	58,245,216	+3,889,356
Operating ratio	61.5	+4.6
Net Revenue from Operations	36,455,911	−4,708,776
Railway tax accruals	22,240,100	−2,255,273
Railway Operating Income	14,215,811	−2,453,503
Equipment and joint facility rents—Bal. Dr.	4,938,379	+46,733
Net Railway Operating Income	9,277,432	−2,500,236
Total other income	871,385	+107,846
Total Income	10,148,817	−2,392,390
Rent for leased roads	377,876	+99,671
Interest on funded debt—fixed interest	2,040,361	−63,670
Total Fixed Charges	2,423,691	+21,522
Net Income	6,518,154	−2,240,420
Disposition of net income:		
Income applied to sinking fund and other reserve funds	146,253	−29,260
Dividend appropriations of income	1,399,633	.....

Average Prices Stocks and Bonds

	April 13	Last week	Last year
Average price of 20 representative railway stocks..	49.90	48.70	39.83
Average price of 20 representative railway bonds..	95.92	95.56	87.23

Dividends Declared

Atchison, Topeka & Santa Fe.—$1.50, quarterly, payable June 1 to holders of record May 4.

Dover & Rockaway.—$3.00, semi-annually, payable April 2 to holders of record March 31.

Newark & Bloomfield.—$1.50, semi-annually, payable April 2 to holders of record March 27.

Philadelphia & Trenton.—$2.50, quarterly, payable April 10 to holders of record March 31.

Railway Officers

EXECUTIVE

Charles H. Mottier, whose election to vice-president and chief engineer of the Illinois Central, with headquarters at Chicago, was reported in the *Railway Age* of March 24, was born at Gibson City, Ill., on April 21, 1888, and graduated in civil engineering from the University of Illinois in 1910. He entered railway service in 1910 as an instrumentman and inspector on track elevation work for the Chicago, Burlington & Quincy in Chicago, and in February, 1911, went with the Illinois Central on construction work in the bridge department, serving successively as masonry inspector, construction foreman, draftsman, designer and assistant engineer. In 1918 he was transferred to the office of the chief engineer at Chicago as an assistant engineer, later being promoted to office engineer. In 1920 Mr. Mottier was appointed office engineer

Charles H. Mottier

of the Chicago terminal improvements of the Illinois Central, and in 1924 he was appointed engineer of design, with headquarters as before at Chicago. In 1935 he was promoted to assistant to the vice-president and chief engineer, and in July, 1941, he was advanced to chief engineer.

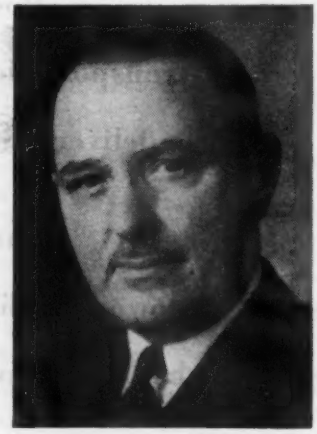
Vernon W. Foster, whose election to vice-president and general counsel of the Illinois Central, with headquarters at Chicago, was reported in the *Railway Age* of March 24, was born at Norwalk, Ohio, on January 16, 1881, and attended a business college at Sandusky, Ohio, later taking a secretarial course at a shorthand school at Chicago. He entered the service of the Illinois Central in July, 1898, as secretary to the auditor of passenger receipts at Chicago, being transferred to the law department in the following year as secretary to the assistant general solicitor. Mr. Foster then began the study of law in his spare time at the Kent College of Law, Chicago, completing his course in 1902. He was advanced through the positions of court reporter, investigator of claims and assistant to the local attorney, being appointed assistant local attorney for the Illinois Central in Cook County on January 1, 1906. On July 1, 1916, he was promoted to local attorney for the same territory and on January 1, 1926, he was further advanced to district attorney. Mr. Foster was appointed general attorney at Chicago on July 1, 1932, and in April, 1933, he was

Vernon W. Foster

promoted to general solicitor for the Northern lines. In 1938 his jurisdiction was extended to cover the system. In April 1942, he was promoted to general counsel, with the same headquarters.

Everette A. Craft, vice-president of the Southern Pacific Lines in Texas and Louisiana at Houston, Tex., has been advanced to executive vice-president, with the same headquarters, succeeding **H. M. Lull,** who has retired.

Mr. Craft was born at Danville, Ill., on September 11, 1893, and entered railway service in October, 1909, as a chainman on the Chicago & Eastern Illinois. He was later promoted to transitman and in 1914, he was advanced to assistant division engineer of the Evansville division, later being transferred successively to the Illinois and

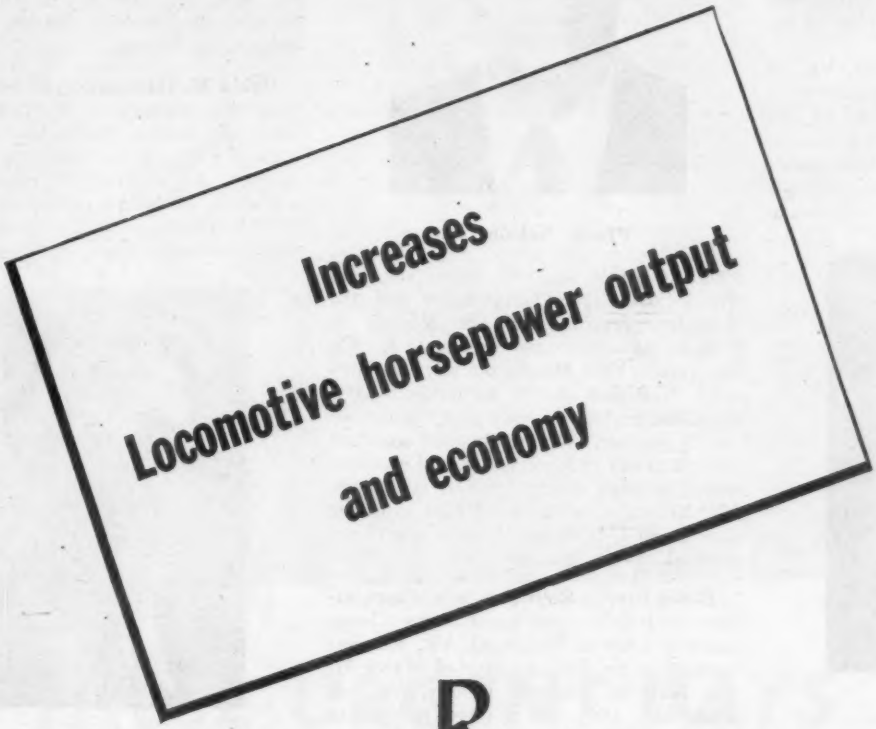


Everette A. Craft

the Chicago divisions. In June, 1917, he was commissioned first lieutenant in the Engineers' Officers Reserve Corps, assigned with the 17th Engineers (Railway) at St. Nazaire, France. Mr. Craft was transferred to the Transportation Corps on November 1, 1917, and from January 1, 1918, to August, 1919, was a superintendent in the

News Department continued on next left-hand page

THE FRANKLIN SYSTEM OF STEAM DISTRIBUTION



Road tests, dynamometer tests and service records prove that The Franklin System of Steam Distribution overcomes the limitations to locomotive design imposed by conventional types of steam distribution, and assures a substantial increase in horsepower output and economy.

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army transport service, receiving a commission as captain in October, 1918, and as major in February, 1919. He returned to the C. & E. I. as assistant engineer at Danville in October, 1919. In December, 1919, he went with the Southern Pacific Lines in Texas and Louisiana, as division engineer of the El Paso division, with headquarters at El Paso, Tex., and four months later he was appointed assistant to the engineer maintenance of way, with headquarters at Houston. In September, 1920, he was appointed assistant to the chief engineer. Mr. Craft was advanced to engineer maintenance of way in October, 1926, and on March 16, 1939, he was promoted to assistant to the executive vice-president at Houston, and in December, 1943, he was elected to the position he held at the time of his new appointment.

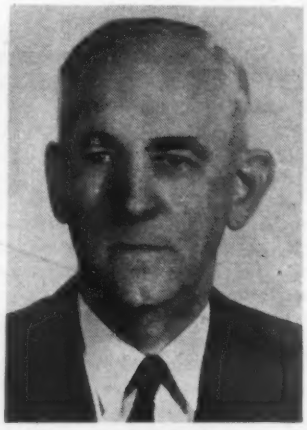
Mr. Lull was born at Windsor, Vt., on March 31, 1875. He was graduated from Dartmouth College, Hanover, N. H., in 1897 and was engaged for a number of years as head of the department of mathematics in the Honolulu High School, entering railway service in May, 1906, as a draftsman

H. M. Lull

in the district engineer's office of the Southern Pacific at San Francisco, Cal. From 1907 until 1915 he served at various points on the lines in California and Oregon as assistant engineer on the Western division, draftsman and computer in the construction department, assistant engineer on the construction of suburban electric lines at Oakland, Cal., and Berkeley, and assistant engineer in the district engineer's office at Portland, Ore. In 1915 he was promoted to assistant division engineer on the Portland division, with headquarters at Portland and three years later he was made division engineer on the same division with the same headquarters. In September, 1920, Mr. Lull was promoted to chief engineer of the Texas and Louisiana lines, with headquarters at Houston, and in 1926 he was advanced to assistant to the president. In 1927 he was elected to the position he held at the time of his retirement.

FINANCIAL, LEGAL AND ACCOUNTING

Frank Nelson, Jr., whose appointment as real estate agent of the Norfolk & Western at Roanoke, Va., was announced in the *Railway Age* of March 3, was born at Rustburg, Va., on October 8, 1884, and attended Virginia Polytechnic Institute prior to entering railroading with the Chesapeake & Ohio in August, 1905. After doing reconnaissance and location work for the Norfolk & Western from February,



Frank Nelson, Jr.

1906, to September, 1906, he served with the United States Government and the Southern, returning to the Norfolk & Western as a draftsman on August 1, 1909. On April 1, 1916, Mr. Nelson was appointed chief draftsman of the valuation department, and he became office pilot the following November. He was named assistant office engineer in March, 1925, and was promoted to office engineer in January, 1929. Mr. Nelson served as chief land appraiser from April 1, 1930, until his recent appointment as real estate agent.

Elder Pierce Reynolds, whose appointment as freight claim agent of the Chesapeake & Ohio at Richmond, Va., was announced in the *Railway Age* of March 17, was born in Tazewell County, Va., on March 10, 1888, and entered railroading with the Chesapeake & Ohio on January

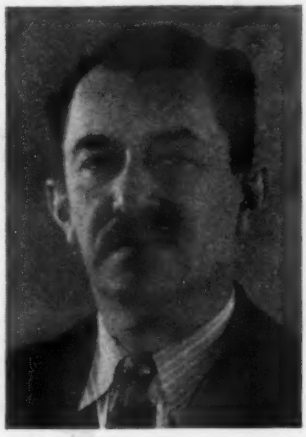
Elder Pierce Reynolds

1, 1902. In 1903 he became stenographer-clerk to the master mechanic at Richmond, Va., transferring to the real estate department the following year. He served as secretary and assistant chief clerk to the general manager from March, 1909, to August, 1913, when he was promoted to chief clerk to the superintendent of passenger transportation and assistant superintendent of transportation. After holding similar positions in the offices of the superintendent of transportation and general superintendent of transportation, Mr. Reynolds was appointed supervisor, merchandise service, in May, 1937, and on December 1, 1943, he became supervisor, merchandise and refrigeration service, the position he held at the time of his recent appointment as freight claim agent.

OPERATING

J. H. Whelan, operating inspector of the Grand Trunk Western at Detroit, Mich., has been promoted to superintendent of the Chicago Terminal district, with headquarters at Chicago.

Pablo M. Hernandez, whose promotion to general manager of the National Railways of Mexico, with headquarters at Mexico City, D. F., was reported in the *Railway Age* of March 3, entered railway service in 1904 as a callboy of that road. He subsequently served as locomotive fireman, locomotive engineman, road foreman



Pablo M. Hernandez

of engines and trainmaster at various points of the road. In 1920 Mr. Hernandez was promoted to division superintendent, serving in that capacity until 1940 when he was advanced to assistant general manager, with headquarters at Mexico City, the position he held at the time of his new appointment.

G. D. Hughey, superintendent of transportation of the Delaware & Hudson at Albany, N. Y., has been appointed assistant general manager with the same headquarters, succeeding **H. F. Burch,** who has been named general superintendent of transportation there. The office of superintendent of transportation has been abolished and its duties have been placed under the jurisdiction of the general superintendent of transportation.

W. H. Shideler, master of trains and tracks of the Missouri-Illinois (part of the Missouri Pacific Lines), at Bonne Terre, Mo., has been promoted to superintendent-agent of the New Orleans & Lower Coast (also a part of the Missouri Pacific Lines), with headquarters at Algiers, La. He succeeds **L. M. Ogilvie,** who has been appointed assistant superintendent of the

News Department continued on next left-hand page

IN THESE URGENT DAYS

when every locomotive must be worked to capacity, it is vitally important to make the most efficient and economical use of fuel.

In oil-burning locomotives the fire brick lining should be properly maintained at all times to secure maximum efficiency from every gallon of fuel.

The use of Security fire brick assures long and satisfactory service, under every kind of operating condition.

HARBISON-WALKER REFRACTORIES CO.
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Memphis division of the Missouri Pacific, with headquarters at Wynne, Ark., replacing **H. H. Gudger,** who has been transferred to the Arkansas division, with headquarters at Little Rock, Ark. **L. E. Smith** has been appointed master of trains and tracks at Bonne Terre, relieving Mr. Shideler. **V. A. Gordon,** trainmaster at Jefferson City, Mo., has been advanced to assistant superintendent of the St. Louis Terminal division, with headquarters at St. Louis, Mo., and **F. E. Fletcher** has been appointed trainmaster at Jefferson City, relieving Mr. Gordon.

R. C. Parker, superintendent of the Eastern division of the Texas & Pacific at Ft. Worth, Tex., has been promoted to general superintendent, with headquarters at Dallas, Tex. **D. Handy** has been appointed superintendent of the Eastern division, succeeding Mr. Parker.

E. J. Gibbons, division superintendent of the New York Central at Cleveland, Ohio, has been transferred to the Toledo division with headquarters at Toledo, Ohio, and **A. Hart,** assistant superintendent of the Erie division at Erie, Pa., has been promoted to superintendent of the Cleveland division at Cleveland succeeding him. **W. H. Leahy,** assistant superintendent of the Michigan Central (a subsidiary of the New York Central) at Chicago, has been transferred to Erie, replacing Mr. Hart.

H. C. Propst, supervisor, scales and weights, of the Chesapeake & Ohio, has been appointed supervisor, merchandise and refrigeration service, at Richmond, Va., succeeding E. P. Reynolds, whose appointment as freight claim agent at Richmond was announced in the *Railway Age* of March 17. **C. P. Epps,** assistant supervisor, merchandise and refrigeration service, has been promoted to supervisor, scales and weights, at Richmond, succeeding Mr. Propst.

R. E. Taylor, division superintendent of the Canadian Pacific at Winnipeg, Man., has been transferred to the Medicine Hat division, with headquarters at Medicine Hat, Alta., succeeding **R. C. Wheeler,** who has been transferred to the Saskatoon division, with headquarters at Saskatoon, Sask. Mr. Wheeler replaces **J. R. Strother,** who has been transferred to the Edmonton division, with headquarters at Edmonton, Alta., where he relieves **J. C. Jones,** who in turn has been transferred to the Moose Jaw division at Moose Jaw, Sask.

Clyde J. Fitzpatrick, whose promotion to superintendent of transportation of the Illinois Central, with headquarters at Chicago, was reported in the *Railway Age* of March 24, was born at Centralia, Ill., on December 7, 1908, and entered railway service on June 3, 1924, as a telegraph operator on the St. Louis division of the Illinois Central. On April 29, 1929, he was promoted to train dispatcher and on March 30, 1930, he was transferred to the Wisconsin division. From September 21, 1931, to October 6, 1936, Mr. Fitzpatrick served as a dispatcher and telegraph operator on the Springfield division, a laborer and carman helper in the mechanical department at Centralia, and chief clerk in the locomotive department at the Markham (Chicago) yard. On the latter date he was appointed a telegraph operator in the Chicago terminal. From September 1, 1937, to April 15, 1940, he served as station inspector, acting assistant general yardmaster, clerk in the superintendent's office and telegraph operator in the Chicago terminal. On the latter date Mr. Fitzpatrick was promoted to assistant trainmaster and on January 16, 1941, he was advanced to trainmaster at Freeport, Ill. He was transferred to McComb, Miss., on November 1, 1941, where he remained until November, 1942, when he was promoted to superintendent of the Springfield division, with headquarters at Clinton, Ill., the position he held at the time of his new appointment.

Frank Wallace Myers, whose appointment as superintendent of the Russell division of the Chesapeake & Ohio at Russell, Ky., was announced in the *Railway Age* of March 10, was born on June 21, 1889, at Ashland, Ky., and entered railway service with the Chesapeake & Ohio on August 1, 1905, as a clerk at Russell. He became a brakeman on the Cincinnati division in November, 1908, and returned to Russell as clerk and yardmaster in May, 1910. After serving as brakeman on the Ashland division from November, 1914, to January, 1915, and yardmaster at Logan, W. Va., from January, 1915, to August, 1918, he was appointed assistant trainmaster of the Logan division, becoming trainmaster of that division in June, 1921. In December, 1926, Mr. Myers transferred to the Hinton division, where he was appointed assistant superintendent in January, 1944. The following September Mr. Myers transferred to the Huntington division where he remained until his recent promotion to superintendent of the Russell division.

Frank Wallace Myers

Richard H. Carter, whose promotion to superintendent of the Mississippi division of the Illinois Central, with headquarters at Water Valley, Miss., was reported in the *Railway Age* of March 31, was born at New York on August 16, 1891, and received his higher education at the University of Ottawa. He entered railway service with the I. C., in September, 1914, as a chainman at Water Valley, subsequently serving as rodman, instrumentman, assistant engineer, track supervisor, assistant general yardmaster, and acting trainmaster and division engineer at various points on the road. In March, 1943, Mr. Carter was promoted to assistant terminal manager, with headquarters at Chicago, the position he held at the time of his new appointment.

R. A. Woodworth, assistant division superintendent of the Chicago, Milwaukee, St. Paul & Pacific at Milwaukee, Wis., has been promoted to division superintendent, with headquarters at Madison, Wis. **J. M. Moudry,** trainmaster at Aberdeen, S. D., has been advanced to assistant division superintendent, with headquarters at Milwaukee, succeeding Mr. Woodworth, and **R. L. Hicks,** train dispatcher at Savanna, Ill., has been promoted to trainmaster, with headquarters at Chicago Heights, Ill., replacing **J. A. Jakubec,** who in turn has been transferred to Aberdeen, relieving Mr. Moudry.

W. J. Morrison, superintendent of the Utah division of the Union Pacific at Salt Lake City, Utah, has been promoted to general superintendent of the Wyoming-Nebraska divisions with headquarters at Omaha, Neb. **H. E. Shumway,** superintendent of the Nebraska division at Omaha has been advanced to general superintendent of the Kansas-Colorado divisions with headquarters at Kansas City, Mo. **Elgin Hicks,** assistant superintendent of the Nebraska division, has been promoted to superintendent of that division, with headquarters as before at Omaha, succeeding Mr. Shumway and **V. W. Smith,** assistant superintendent of the Los Angeles division, with headquarters at Las Vegas, Nev., has been advanced to superintendent of the Utah division replacing Mr. Morrison. **R. W. McSpadden,** trainmaster at Sidney, Neb., has been promoted to assistant superintendent at North Platte, Neb., relieving **T. F. Shanahan,** who has been transferred to Omaha. **D. F. Wengert,** terminal trainmaster at Salt Lake City has been advanced to assistant superintendent of the Los Angeles division succeeding Mr. Smith. **C. C. Larkin** has been appointed terminal trainmaster at Salt Lake City replacing Mr. Wengert. **C. T. Alford** has been appointed assistant superintendent at Denver, Colo., and **A. G. Ferguson, Ross Crisping,** and **W. W. Watts** have been appointed trainmasters, all with headquarters at Salt Lake City.

TRAFFIC

J. J. Hassett has been appointed district passenger agent of the Seaboard Air Line at New York.

Karl H. Englund has been appointed industrial engineer of the Kansas City Southern, with headquarters at Kansas City, Mo., a newly-created position.

J. D. Benda has been appointed general agent of the Union Pacific with headquarters at New Orleans, La., succeeding **G. J. Garmon,** who has retired after 40 years of service.

C. L. Butler, general freight agent of the Missouri Pacific at St. Louis, Mo., has been promoted to assistant freight traffic

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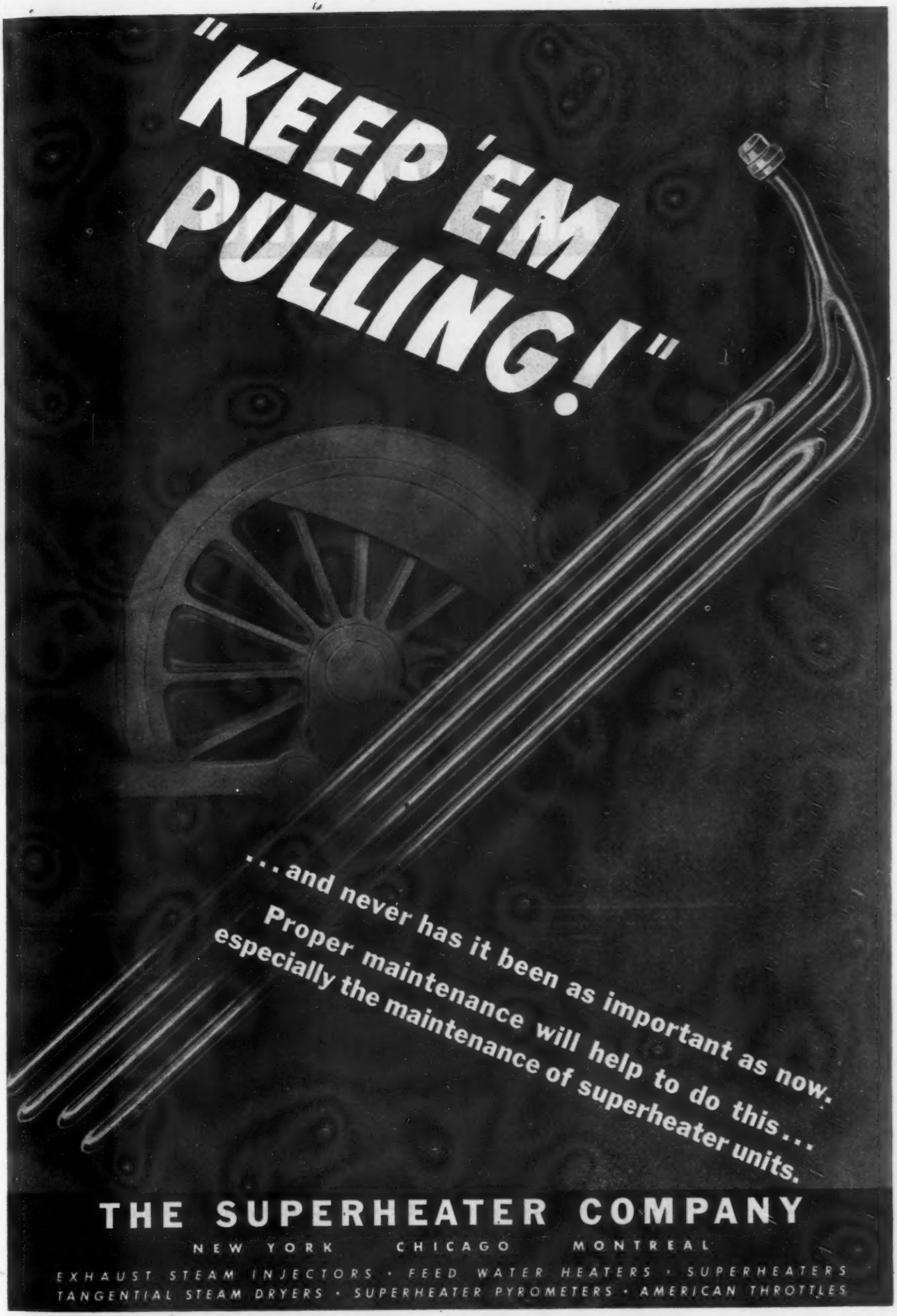
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. . . and never has it been as important as now.
Proper maintenance will help to do this . . .
especially the maintenance of superheater units.
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EXHAUST STEAM INJECTORS • FEED WATER HEATERS • SUPERHEATERS
TANGENTIAL STEAM DRYERS • SUPERHEATER PYROMETERS • AMERICAN THROTTLES

LOCOMOTIVES THAT ARE MAKING HISTORY

Gentlemen, meet the new S-1A

PERHAPS you know this locomotive, already. It is of special interest to the entire railroad world.

Why? The answer lies in a problem that is of major importance to management men on practically every American road... *the problem of handling traffic without excessive locomotive investment.*

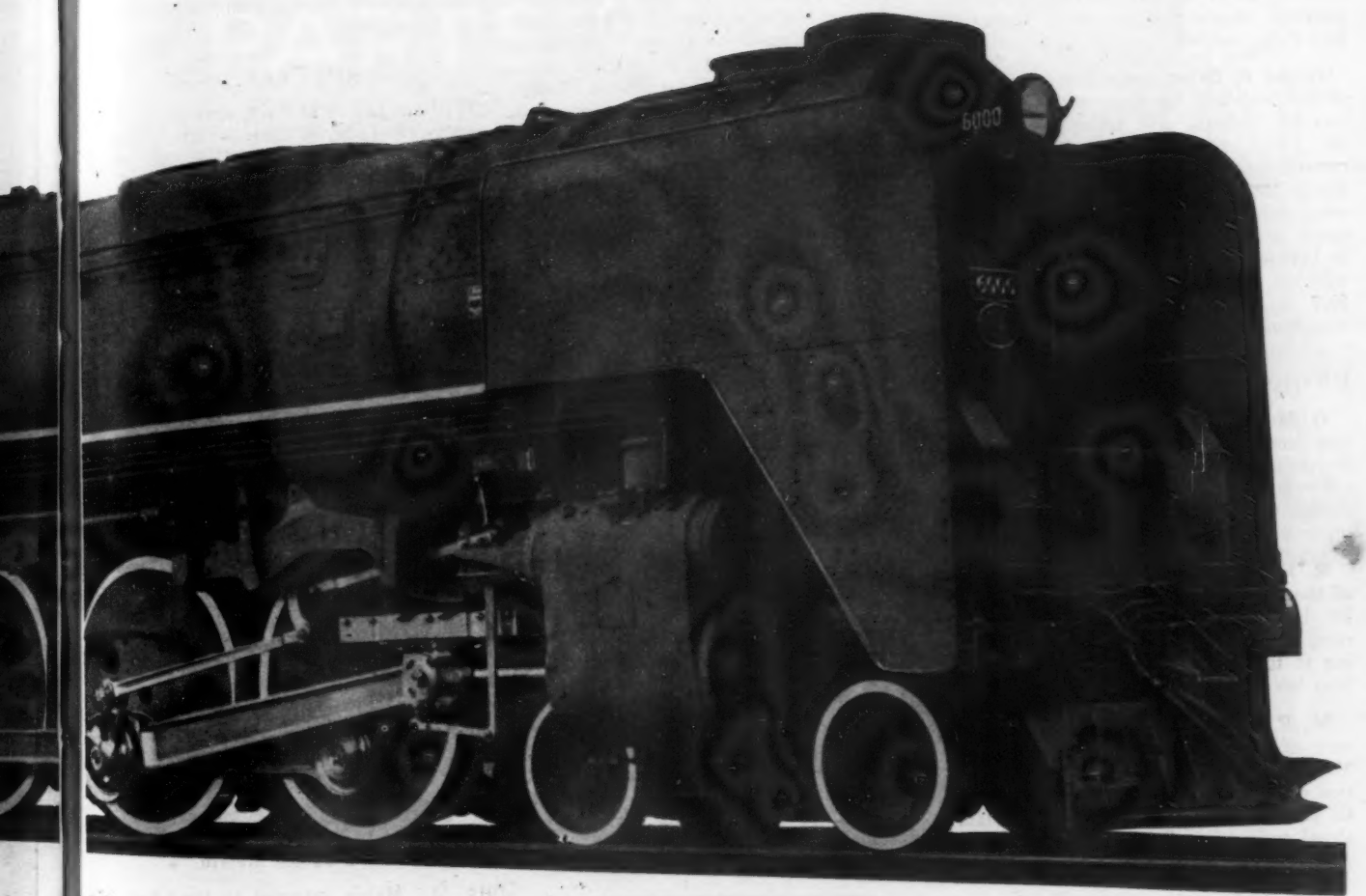
The logical answer to this problem is to provide an efficient *dual-purpose* locomotive—one that can be used effectively both for fast passenger and fast freight hauls.

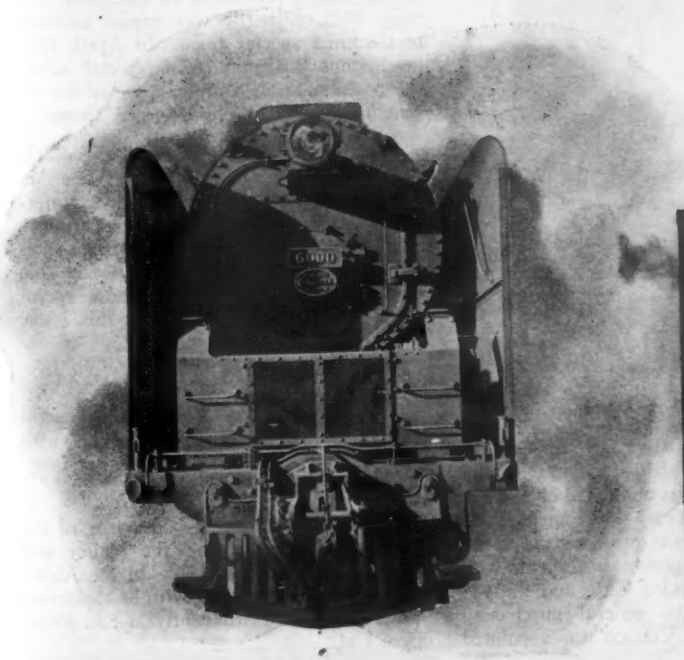
To meet this problem, American Locomotive Company, working with the New York Central System, has developed the locomotive shown above—"The Niagara"—which is designed to combine speed and power.

This locomotive is the latest example of an important development made possible by close cooperation between American Locomotive and The New York Central—a development that helps reduce investment, operation and maintenance costs by reducing the total number of locomotives a railroad needs in order to do its job.

• • •

Locomotive designs developed by American Locomotive Company have been, are, and will continue to be powerful factors in American railroad-operating efficiency and economy.





American Locomotive

NEW YORK

manager, with the same headquarters, succeeding **H. R. Wilson,** who has resigned. **C. J. Bindner,** assistant coal traffic manager, has been advanced to general freight agent, with headquarters as before at St. Louis, and **J. A. Fyfe,** assistant general freight agent at St. Louis, has been promoted to assistant coal traffic manager, with the same headquarters, relieving Mr. Bindner. **A. B. Strunk** has been appointed assistant general freight agent, replacing Mr. Fyfe.

David P. Grier, general western agent of the Seaboard Air Line, with headquarters at Chicago, will retire on May 1. Mr. Grier was born at Peoria, Ill., and entered railway service with the Chicago, Burlington & Quincy in 1897. In 1904 he went with the Seaboard as traveling freight agent, with headquarters at St. Louis, Mo. In 1918 he was appointed commercial agent with the same headquarters, and in March 1927 he was promoted to the position he now holds.

ENGINEERING & SIGNALING

G. M. Helmig has been appointed division engineer of the Missouri-Memphis divisions of the Missouri Pacific, with headquarters at Poplar Bluff, Mo., succeeding **J. M. Giles,** who has been assigned to other duties.

R. E. Copper, assistant chief engineer of the Peoria & Pekin Union at Peoria, Ill., has been appointed acting chief engineer, with the same headquarters, succeeding to the duties of **E. H. Thornberry,** who has been granted a leave of absence.

M. F. Anderson, assistant signal engineer of the Pere Marquette at Detroit, Mich., has been promoted to communication engineer, with the same headquarters. **G. N. Black** has been appointed assistant signal engineer at Detroit, succeeding Mr. Anderson.

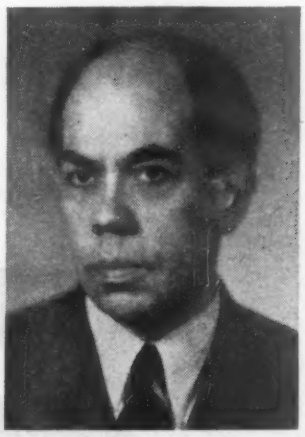
C. L. Crummett, assistant division engineer of the Chesapeake & Ohio at Richmond, Va., has been promoted to division engineer of the Clifton Forge division at Clifton Forge, Va., succeeding Garrett B. Wall, Jr., whose promotion to assistant to the vice-president in charge of real estate, tax, magazine and legislative matters was reported in the *Railway Age* of March 10.

Guy H. Watson, whose retirement as engineer of track of the Boston & Maine at Boston, Mass., was announced in the *Railway Age* of March 3, was born at Lyndonville, Vt., on February 23, 1880, and was graduated from Norwich University. He entered railroading with the Boston & Maine in December, 1902, as a rodman, and after serving subsequently with the Pennsylvania and the Central Vermont as assistant engineer of construction and resident engineer, respectively, he returned to the Boston & Maine as assistant engineer in May, 1906. In July, 1915, he was appointed division engineer of the White Mountain division, and ten years later he transferred to the Portland division at Salem, Mass. Mr. Watson was promoted to assistant to the engineer, maintenance of way, in April, 1927, and on July 1, 1938, he was advanced to engineer of track, the position he held at the time of his retirement.

J. P. Hiltz, Jr., whose appointment as engineer of track of the Delaware, Lackawanna & Western was announced in the *Railway Age* of March 10, was born at Baltimore, Md., and was graduated from Baltimore Polytechnic Institute in 1929, receiving his degree as bachelor of science in civil engineering from Carnegie Institute of Technology in 1934. He entered railroading with the Pennsylvania in June, 1934, as an assistant master carpenter in the engineering corps, and served subsequently at Newport, Pa., Lancaster, and Washington, D. C. In February, 1935, he was appointed assistant supervisor of the Baltimore division in charge of drainage, and after transferring to Bordentown, N. J., Trenton, and Jersey City, he was promoted to supervisor at Enola, Pa., in January, 1940. The following October Mr. Hiltz went to Philadelphia, Pa., on special duty in the office of the comptroller. He became assistant agent in the real estate department at New York in June, 1941, and was appointed supervisor of track at Northumberland, Pa., on February 1, 1943. The next July Mr. Hiltz transferred to Jamaica, N. Y., where he remained until his recent appointment as engineer of track of the Delaware, Lackawanna & Western.

PURCHASES AND STORES

Juan M. Velasco, whose promotion to general purchasing agent of the National Railways of Mexico, with headquarters at Mexico City, D. F., was reported in the *Railway Age* of March 3, entered railway service with that road in 1905 as an employee of the stores department, subsequently serving in various minor capacities until August, 1915, when he was advanced to assistant to the purchasing agent, with headquarters at El Paso, Tex. In May,



Juan M. Velasco

1916, he was promoted to storekeeper, with headquarters at Chihuahua, Chih. One year later Mr. Velasco was appointed chief clerk of the railway's New York agency. In February, 1919, he was promoted to assistant to the general purchasing agent, with headquarters at Mexico City, and in 1938 he was advanced to general purchasing agent. In 1941 Mr. Velasco was appointed chief of the purchasing department, the position he held at the time of his reappointment as general purchasing agent.

MECHANICAL

C. R. Rush, master mechanic of the Missouri Pacific at DeQuincy, La., has been promoted to mechanical superintendent of the Southern district, with headquarters at St. Louis, Mo.

SPECIAL

William James Melvin, whose appointment as chief special agent of the Chesapeake & Ohio at Richmond, Va., was announced in the *Railway Age* of March 17, was born at East Radford, Va., on November 3, 1894, and entered the service of the Chesapeake & Ohio on August 15, 1912, as a clerk-stenographer at Richmond. On October 1, 1916, he was promoted to chief clerk to the chief special agent, and one year later he became secretary to the president. After serving with the United States Army from March, 1918, to April,

William James Melvin

1919, Mr. Melvin returned to the Chesapeake & Ohio as chief clerk to the chief special agent, remaining in that post until May, 1925, when he was named assistant to the chief special agent. In April, 1941, he became assistant chief special agent, the position he held at the time of his recent promotion to chief special agent.

R. K. Stickney, engine foreman of the Atchison, Topeka & Santa Fe at Los Angeles, Cal., has been promoted to safety supervisor of the San Francisco Terminal, the Valley and part of the Arizona divisions, with headquarters at Fresno, Cal., succeeding **S. C. Flagler,** whose recent death is reported elsewhere in this issue.

OBITUARY

George G. Wall, assistant general manager of the Pacific Fruit Express, with headquarters at Omaha, Neb., died at Portland, Ore., on March 29.

S. C. Flagler, safety supervisor of the San Francisco Terminal, the Valley and part of the Arizona divisions of the Atchison, Topeka & Santa Fe, with headquarters at Fresno, Cal., died recently at San Francisco, Cal.

Table of Freight Operating Statistics appears on next left-hand page

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. . and HUNT-SPILLER *Air Furnace* GUN IRON helps keep it on the "firing line" of the battle of transportation.

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Cylinder Bushings
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Pistons or Piston Bull Rings
Valve Bushings
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Valve Bull Rings
Crosshead Shoes
Hub Liners
Shoes and Wedges
Floating Rod Bushings
Finished Parts
Dunbar Sectional Type Packing
Duplex Sectional Type Packing
for Cylinders and Valves
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Sectional Packing)
Cylinder Snap Rings
Valve Rings, All Shapes
Light Weight Valves
Cylinder Liners and Pistons
for Diesel Service

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Freight Operating Statistics of Large Steam Railways—Selected

Region, road, and year		Miles of road operated	Train-miles	Locomotive-miles: Principal and helper	Locomotive-miles: Light	Car-miles: Loaded (*thousands*)	Car-miles: Per cent loaded	Ton-miles (*thousands*): Gross excl. locos. & tenders	Ton-miles (*thousands*): Net-rev. and non-rev.	Road locos. on line: Serviceable: Unstored	Road locos. on line: Serviceable: Stored	Road locos. on line: B. O.	Road locos. on line: Per cent B. O.
New England Region:													
Boston & Albany	1945	362	152,129	168,905	22,450	3,173	70.2	192,350	82,503	71	..	22	23.7
	1944	362	157,893	195,592	35,165	3,974	63.4	261,138	110,368	83	..	10	10.8
Boston & Maine	1945	1,789	369,892	395,414	23,739	12,802	69.1	819,493	364,372	137	5	22	13.4
	1944	1,807	407,314	473,425	51,528	14,056	65.8	925,951	402,094	154	..	20	11.5
N. Y., New H. & Hartf.†	1945	1,815	* 485,858	611,271	60,876	17,209	68.7	1,036,635	448,147	220	6	41	17.9
	1944	1,815	543,933	654,805	61,799	19,269	65.7	1,226,238	534,784	222	1	42	18.5
Great Lakes Region:													
Delaware & Hudson	1945	846	311,133	380,379	38,760	12,593	69.4	870,112	457,202	118	52	45	20.9
	1944	848	349,113	436,175	41,635	14,818	66.1	1,061,914	553,942	145	37	36	16.5
Del., Lack. & Western	1945	971	349,896	417,334	77,983	13,274	71.1	861,840	409,223	153	7	42	20.8
	1944	971	379,993	450,353	80,015	16,413	67.7	1,101,797	520,037	156	16	28	14.0
Erie	1945	2,243	936,555	1,003,702	83,867	42,119	70.0	2,669,166	1,199,809	346	5	54	13.3
	1944	2,244	1,103,672	1,195,313	92,739	49,147	64.3	3,287,322	1,440,973	321	..	76	19.1
Grand Trunk Western	1945	1,026	287,608	301,275	3,025	8,981	71.5	560,919	259,556	66	2	15	18.1
	1944	1,026	295,353	312,776	2,853	9,073	65.5	603,312	270,708	68	1	11	13.8
Lehigh Valley	1945	1,247	416,196	455,353	64,858	16,581	63.9	1,155,298	549,200	159	..	10	5.9
	1944	1,247	565,799	627,491	91,674	23,063	62.4	1,633,286	775,894	151	..	16	9.6
New York Central	1945	10,331	3,255,158	3,525,888	246,558	112,916	67.9	7,629,402	3,699,575	1,121	10	240	17.5
	1944	10,325	3,872,262	4,172,498	268,634	141,055	60.8	10,126,181	4,659,309	1,179	6	239	16.8
New York, Chi. & St. L.	1945	1,656	697,105	714,374	11,146	26,653	72.3	1,694,223	807,652	183	3	19	9.3
	1944	1,657	898,481	915,341	11,470	33,708	65.4	2,228,096	1,004,968	170	..	13	7.1
Pere Marquette	1945	1,915	398,931	411,651	9,662	13,006	73.9	849,799	430,500	150	..	17	10.2
	1944	1,945	468,126	484,831	11,074	14,674	65.6	1,015,020	487,389	140	..	23	14.1
Pitts. & Lake Erie	1945	229	90,264	91,831	230	3,462	66.7	284,710	169,354	25	..	16	39.0
	1944	229	97,173	102,066	10	4,005	61.6	348,102	200,490	29	..	14	32.6
Wabash	1945	2,381	733,205	760,091	19,360	26,080	73.9	1,659,425	797,551	178	..	37	17.2
	1944	2,381	768,732	795,828	18,908	27,884	70.0	1,821,315	858,250	174	8	40	18.0
Central Eastern Region:													
Baltimore & Ohio	1945	6,101	2,341,287	2,887,083	313,451	77,615	68.1	5,392,390	2,696,161	957	..	217	18.5
	1944	6,109	2,473,517	3,039,138	306,645	80,498	61.8	5,862,148	2,836,799	938	2	198	17.4
Central of New Jersey†	1945	654	223,823	257,158	60,629	7,398	62.4	541,012	267,266	123	2	27	17.8
	1944	655	241,589	283,023	62,586	8,599	60.2	634,078	314,431	135	4	15	9.7
Chicago & Eastern Ill.	1945	912	267,407	271,516	7,388	7,867	66.7	536,974	261,013	71	2	7	8.8
	1944	912	317,013	324,636	10,672	9,133	57.8	666,979	297,550	79	..	7	8.1
Elgin, Juliet & Eastern	1945	392	136,378	141,969	5,472	3,963	67.1	305,431	166,722	63	..	14	18.2
	1944	392	137,474	141,223	3,245	3,790	65.2	301,223	164,284	63	..	13	17.1
Long Island	1945	372	33,063	34,665	17,068	330	57.7	23,356	10,092	48	..	3	5.9
	1944	372	35,734	37,288	15,235	396	57.1	29,099	12,263	42	..	8	16.0
Pennsylvania System	1945	9,868	4,353,186	5,091,426	724,247	160,086	67.5	10,857,140	5,316,286	2,034	..	181	8.2
	1944	9,893	4,966,456	5,818,604	770,092	182,190	60.8	13,330,588	6,326,582	2,039	..	175	7.9
Reading	1945	1,371	591,081	653,303	80,294	18,553	66.4	1,376,189	743,949	271	..	52	16.1
	1944	1,416	593,545	671,084	89,776	19,404	64.5	1,488,703	806,121	289	8	44	12.9
Pocahontas Region:													
Chesapeake & Ohio	1945	3,036	1,172,651	1,274,606	64,985	50,554	57.3	4,344,345	2,464,855	449	10	68	12.9
	1944	3,032	1,184,123	1,293,617	62,597	50,514	56.3	4,400,122	2,501,887	456	..	65	12.5
Norfolk & Western	1945	2,132	871,547	950,950	78,692	39,079	60.7	3,284,747	1,790,325	310	4	14	4.3
	1944	2,132	865,062	948,026	80,701	37,436	58.2	3,304,441	1,803,703	302	8	18	5.5
Southern Region:													
Atlantic Coast Line	1945	4,926	1,195,980	1,213,582	16,959	31,658	60.5	2,174,314	942,149	400	8	27	6.2
	1944	4,953	1,098,608	1,123,713	15,625	29,971	63.5	2,011,459	886,644	369	..	26	6.6
Central of Georgia†	1945	1,783	372,653	388,606	6,241	9,028	72.0	588,543	280,565	95	..	11	10.4
	1944	1,783	375,111	390,261	6,704	9,057	68.5	605,667	285,801	99	..	10	9.2
Gulf, Mobile & Ohio	1945	1,941	261,828	335,278	1,640	9,759	78.9	593,521	289,013	105	1	11	9.4
	1944	1,962	284,092	352,102	1,043	9,629	75.1	611,357	301,584	110	..	10	8.3
Illinois Central (incl. Yazoo & Miss. Vy.)	1945	6,347	1,620,342	1,642,327	30,237	59,404	66.7	4,064,954	1,968,477	643	3	52	7.4
	1944	6,347	1,809,566	1,826,393	33,968	68,045	62.8	4,826,400	2,276,821	659	1	47	6.6
Louisville & Nashville	1945	4,746	1,713,200	1,878,784	50,346	43,550	65.8	3,070,730	1,590,155	428	2	65	13.1
	1944	4,736	1,670,637	1,819,258	50,144	41,544	63.4	2,984,412	1,517,407	427	4	55	11.3
Seaboard Air Line*	1945	4,163	923,564	989,759	16,839	26,835	69.6	1,746,957	782,647	308	..	44	12.5
	1944	4,165	1,002,351	1,078,687	15,356	27,144	65.5	1,845,239	811,612	302	..	39	11.4
Southern	1945	6,471	2,252,687	2,295,880	43,533	50,515	70.8	3,193,467	1,493,491	606	..	93	13.3
	1944	6,479	2,282,609	2,333,743	36,400	51,207	68.1	3,325,979	1,533,083	604	..	82	12.0
Northwestern Region:													
Chi. & North Western	1945	8,069	1,072,807	1,123,653	24,155	30,758	66.7	2,156,103	968,877	363	12	111	22.8
	1944	8,098	1,119,550	1,177,574	24,013	34,916	67.0	2,368,398	1,134,770	388	22	91	18.2
Chicago Great Western	1945	1,445	300,357	309,121	8,028	9,167	73.4	584,749	267,288	73	..	9	11.0
	1944	1,445	302,628	309,650	12,611	9,365	68.7	630,320	286,062	73	..	7	8.8
Chi., Milw., St. P. & Pac.†	1945	10,714	1,641,664	1,759,565	81,449	55,219	68.9	3,663,843	1,763,844	511	24	86	13.8
	1944	10,734	1,593,681	1,701,530	74,690	52,628	69.7	3,505,552	1,712,090	520	31	85	13.4
Chi., St. P., Minneap. & Om.	1945	1,606	217,543	235,883	14,437	5,012	64.7	372,363	177,561	93	12	23	18.0
	1944	1,606	237,146	254,377	15,228	6,182	66.8	432,797	201,249	96	28	9	6.8
Duluth, Missabe & I. R.	1945	546	29,393	29,736	1,254	475	61.4	30,688	14,825	24	15	17	30.4
	1944	544	29,201	29,282	285	516	59.9	33,147	15,920	25	6	20	39.2
Great Northern	1945	8,276	1,194,603	1,196,953	54,342	42,293	72.5	2,777,438	1,339,674	381	38	65	13.4
	1944	8,278	1,224,337	1,225,895	52,344	42,560	71.4	2,888,077	1,427,353	401	14	66	13.7
Min., St. P. & S. St. M.†	1945	4,259	425,461	436,848	8,132	10,562	68.7	700,821	334,641	128	3	6	4.4
	1944	4,258	553,520	569,962	10,912	14,186	62.4	1,024,479	487,121	143	2	5	3.3
Northern Pacific	1945	6,570	985,336	1,062,561	84,059	39,721	73.6	2,682,596	1,367,755	384	14	60	13.1
	1944	6,571	953,757	1,024,257	84,691	38,170	75.0	2,552,294	1,322,943	362	25	59	13.2
Central Western Region:													
Alton†	1945	915	279,544	293,925	743	7,474	74.5	475,810	202,361	77	..	2	2.5
	1944	915	262,236	281,558	937	6,975	69.5	461,206	221,944	72	..	4	5.3
Atch., Top. & S. Fe incl. G. C. & S. F. & P. & S.F.)	1945	13,115	3,410,002	3,619,255	189,682	122,731	67.5	7,989,493	3,359,947	877	6	130	12.8
	1944	13,124	3,066,814	3,291,578	197,520	104,322	66.4	7,049,173	2,984,192	862	6	93	9.7
Chi., Burl. & Quincy	1945	8,790	1,404,716	1,477,917	53,019	52,298	69.3	3,546,942	1,725,084	484	..	75	13.4
	1944	8,794	1,538,036	1,630,021	50,817	55,543	66.3	3,872,469	1,854,369	504	..	57	10.2
Chi., Rock I. & Pac.†	1945	7,716	1,428,613	1,483,166	16,666	43,900	72.8	2,735,695	1,264,432	401	..	63	13.6
	1944	7,718	1,425,464	1,484,613	17,892	41,769	66.3	2,780,011	1,237,761	396	..	68	14.7
Denver & R. G. Wn.†	1945	2,386	438,255	489,456	74,783	14,531	78.0	923,704	474,192	168	15	33	15.3
	1944	2,399	442,024	505,973	76,819	15,389	79.4	964,548	492,329	183	2	34	15.5
Southern Pacific—Pac. Lines	1945	8,179	2,280,248	2,591,297	416,044	94,175	68.1	6,141,660	2,610,090	780	2	142	15.4
	1944	8,194	2,250,427	2,542,911	368,439	91,569	69.9	5,925,544	2,601,747	806	1	120	12.9
Union Pacific	1945	9,781	3,059,497	3,262,239	273,003	111,093	70.3	7,288,070	3,266,896	822	19	76	8.3
	1944	9,782	3,153,453	3,364,907	288,870	109,875	71.4	7,208,125	3,225,209	824	..	66	7.4
Southwestern Region:													
Mo.-Kans.-Texas Lines	1945	3,241	834,447	868,572	16,945	22,591	64.2	1,516,991	700,627	155	..	17	9.9
	1944	3,281	729,630	755,823	13,207	18,804	59.7	1,310,137	573,232	152	..	17	10.1
Missouri Pacific†	1945	7,056	1,720,459	1,814,057	47,581	60,245	67.5	4,041,224	1,870,607	449	..	77	14.6
	1944	7,071	1,855,380	1,947,347	43,586	62,729	65.6	4,304,343	1,990,490	484	1	61	11.2
Texas & Pacific	1945	1,882	462,542	462,542	7,249	15,837	67.3	1,039,168	432,339	134	12	16	9.9
	1944	1,882	427,807	427,807	5,651	13,937	66.1	907,831	379,447	118	18	14	9.3
St. Louis-San Francisco†	1945	4,616	1,085,946	1,156,120	21,957	26,669	72.0	1,712,442	819,622	319	..	32	9.1
	1944	4,628	1,132,232	1,207,808	28,448	27,484	66.4	1,857,805	869,422	343	..	20	5.5
St. Louis-San Fran. & Texas	1945	159	37,203	37,813	3	621	73.2	39,492	16,901	8	..	..	..
	1944	159	35,965	36,784	6	624	71.8	37,182	16,135	9	..	1	10.0
St. Louis Southw. Lines†	1945	1,600	505,889	512,373	6,785	17,613	72.6	1,083,675	476,969	118	3	19	13.6
	1944	1,600	546,093	555,912	7,911	17,872	66.1	1,135,056	491,052	122	2	24	16.2
Texas & New Orleans	1945	4,331	1,190,465	1,193,152	36,948	30,863	65.1	2,075,248	967,673	256	..	19	6.9
	1944	4,339	1,183,177	1,189,285	34,553	31,442	64.5	2,133,816	914,958	256	1	20	7.2

* Report of receivers.
† Report of trustee or trustees.

Items for the Month of January 1945 Compared with January 1944

Region, road, and year	Freight cars on line: Home	Foreign	Total	Per Cent B. O.	G.t.m. per train-hr. excl. locos. and tenders	G.t.m. per train-mi. excl. locos. and tenders	Net ton-mi. per train-mile	Net ton-mi. per l'd. car-mile	Net ton-mi. per car-day	Car miles per car-day	Net daily ton-mi. per road-mi.	Coal lb. per 1000 g.t.m. inc. loco.	Mi. per loco. per day
New England Region:													
Boston & Albany 1945	274	6,276	6,550	0.2	16,719	1,282	550	26.0	389	21.3	7,352	245	76.3
1944	315	5,981	6,296	0.3	22,500	1,659	701	27.8	500	28.4	9,835	224	88.7
Boston & Maine 1945	1,988	11,793	13,781	3.3	32,929	2,222	988	28.5	862	43.8	6,570	123	85.0
1944	1,899	9,771	11,670	2.0	34,056	2,281	990	28.6	1,046	55.6	7,178	109	101.9
N. Y., New H. & Hartf.† 1945	2,392	24,122	26,514	3.6	27,881	2,146	928	26.0	565	31.6	7,965	120	84.8
1944	3,118	22,492	25,610	2.5	32,352	2,289	998	27.8	676	37.1	9,505	113	91.1
Great Lakes Region:													
Delaware & Hudson 1945	3,525	7,594	11,119	3.3	44,699	2,814	1,479	36.3	1,454	57.7	17,433	128	64.2
1944	3,422	6,828	10,250	1.8	49,158	3,057	1,595	37.4	1,824	73.8	21,072	115	73.1
Del., Lack. & Western 1945	5,591	16,858	22,449	3.5	29,759	2,507	1,190	30.8	610	27.8	13,595	163	85.0
1944	5,518	14,458	19,976	2.5	40,639	2,929	1,383	31.7	871	40.6	17,276	132	92.3
Erie 1945	9,734	37,998	47,732	3.4	41,111	2,880	1,295	28.5	886	44.5	17,255	121	94.0
1944	11,175	29,400	40,575	2.3	49,063	2,993	1,312	29.3	1,166	61.8	20,714	104	111.4
Grand Trunk Western 1945	2,005	8,726	10,731	4.0	37,447	1,974	913	28.9	808	39.1	8,161	96	129.4
1944	1,906	5,725	7,631	4.2	43,125	2,052	921	29.8	1,121	57.4	8,511	85	132.4
Lehigh Valley 1945	6,499	28,149	34,648	2.2	35,871	2,880	1,369	33.1	546	25.8	14,207	144	105.4
1944	6,873	22,866	29,739	1.7	45,263	3,000	1,425	33.6	877	41.8	20,071	121	145.2
New York Central 1945	48,093	129,163	177,256	2.6	31,771	2,391	1,160	32.8	724	32.6	11,552	135	98.7
1944	46,043	106,640	152,683	2.2	38,766	2,648	1,218	33.0	932	46.4	14,557	113	110.9
New York, Chi. & St. L. 1945	2,220	17,110	19,330	2.4	37,873	2,468	1,176	30.3	1,385	63.3	15,733	108	121.0
1944	2,765	14,033	16,798	1.8	44,369	2,493	1,125	29.8	2,006	103.0	19,564	94	173.5
Pere Marquette 1945	1,955	10,810	12,765	2.0	37,189	2,166	1,097	33.1	1,157	47.3	7,252	109	86.9
1944	2,365	8,903	11,268	2.4	33,242	2,198	1,056	33.2	1,474	67.7	8,083	98	102.9
Pitts. & Lake Erie 1945	3,274	9,809	13,083	4.4	39,697	3,163	1,881	48.9	426	13.1	23,856	122	74.2
1944	3,698	9,489	13,187	3.6	46,738	3,588	2,066	50.1	528	17.1	28,242	103	83.8
Wabash 1945	5,115	13,971	19,086	3.2	40,245	2,289	1,100	30.6	1,350	59.7	10,805	127	122.0
1944	5,958	14,913	20,871	1.5	45,708	2,396	1,129	30.8	1,435	66.6	11,628	113	122.8
Central Eastern Region:													
Baltimore & Ohio 1945	33,409	61,157	94,566	3.7	26,415	2,365	1,183	34.7	948	40.0	14,256	174	92.0
1944	36,219	58,873	95,092	2.3	29,364	2,428	1,175	35.2	969	44.5	14,979	162	98.6
Central of New Jersey† 1945	4,641	14,754	19,395	3.9	28,953	2,440	1,205	36.1	445	19.8	13,183	147	83.8
1944	4,470	24,363	28,833	1.4	26,607	2,656	1,317	36.6	368	16.7	15,485	155	97.3
Chicago & Eastern Ill. 1945	1,766	4,025	5,791	2.8	34,448	2,091	1,016	33.2	1,414	63.8	9,232	132	114.5
1944	1,911	5,472	7,383	2.6	35,119	2,168	967	32.6	1,245	66.1	10,525	125	129.4
Elgin, Juliet & Eastern 1945	8,583	8,589	17,172	2.4	14,084	2,375	1,297	42.1	327	11.6	13,720	164	101.2
1944	9,073	7,016	16,089	3.3	17,298	2,310	1,260	43.3	333	11.8	13,519	143	91.7
Long Island 1945	43	5,684	5,727	.3	5,705	729	315	30.6	59	3.3	875	413	46.8
1944	21	5,195	5,216	.5	6,659	839	353	31.0	81	4.6	1,063	350	48.3
Pennsylvania System 1945	127,048	134,509	261,557	3.2	30,087	2,593	1,270	33.2	675	30.1	17,379	154	91.9
1944	115,673	137,268	252,941	2.6	33,354	2,777	1,318	34.7	812	38.5	20,629	140	104.7
Reading 1945	13,019	22,630	35,649	2.4	31,289	2,330	1,259	40.1	682	25.6	17,504	132	82.9
1944	12,105	32,772	44,877	1.4	27,897	2,515	1,362	41.5	616	23.0	18,364	134	85.2
Pocahontas Region:													
Chesapeake & Ohio 1945	30,776	15,287	46,063	1.8	51,526	3,779	2,144	48.8	1,596	57.1	26,190	91	88.6
1944	34,177	15,867	50,044	1.0	51,662	3,780	2,149	49.5	1,621	58.2	26,618	90	91.1
Norfolk & Western 1945	25,789	7,975	33,764	.4	58,747	3,835	2,090	45.8	1,587	57.0	27,088	102	108.5
1944	28,956	7,370	36,326	1.4	59,180	3,894	2,126	48.2	1,500	53.5	27,291	101	108.3
Southern Region:													
Atlantic Coast Line 1945	8,179	23,167	31,346	1.5	29,821	1,829	793	29.8	947	52.6	6,170	116	96.5
1944	8,233	21,861	30,094	2.9	28,856	1,845	813	29.6	930	49.6	5,775	111	99.0
Central of Georgia† 1945	1,624	7,796	9,420	.8	29,798	1,600	763	31.1	991	44.3	5,076	144	125.6
1944	1,724	7,171	8,895	.7	29,834	1,630	769	31.6	1,086	50.3	5,171	130	122.6
Gulf, Mobile & Ohio 1945	1,645	6,549	8,194	.9	38,950	2,272	1,106	29.6	1,109	47.1	4,803	120	99.6
1944	2,120	6,759	8,879	1.2	38,409	2,156	1,063	31.3	1,102	46.9	4,958	131	97.5
Illinois Central (incl. 1945	16,716	31,353	48,069	1.1	40,668	2,592	1,255	33.1	1,284	58.1	10,005	135	80.7
Yazoo & Miss. Vy.) 1944	18,501	33,559	52,060	.8	44,091	2,729	1,287	33.5	1,377	65.5	11,572	125	89.3
Louisville & Nashville 1945	26,408	18,128	44,536	3.0	27,118	1,793	928	36.5	1,132	47.1	10,808	143	132.6
1944	29,287	15,765	45,052	2.0	26,887	1,786	908	36.5	1,059	45.8	10,335	141	129.7
Seaboard Air Line* 1945	5,898	19,376	25,274	1.9	32,364	1,949	873	29.2	984	48.5	6,065	127	103.9
1944	6,272	20,950	27,222	1.5	29,743	1,881	827	29.9	947	48.4	6,286	139	112.0
Southern 1945	15,743	32,182	47,925	2.8	23,371	1,443	675	29.6	992	47.4	7,445	158	112.5
1944	15,989	32,481	48,470	1.8	24,666	1,482	683	29.9	1,048	51.4	7,633	153	116.0
Northwestern Region:													
Chi. & North Western 1945	20,197	30,685	50,882	4.2	31,700	2,088	938	31.5	607	28.9	3,873	145	82.6
1944	20,443	31,101	51,544	4.0	33,674	2,188	1,048	32.5	691	31.7	4,520	136	82.7
Chicago Great Western 1945	788	4,181	4,969	2.3	32,866	1,954	893	29.2	1,752	81.9	5,967	145	136.2
1944	1,082	4,620	5,702	1.0	36,741	2,092	950	30.5	1,642	78.2	6,386	132	136.4
Chi., Milw., St. P. & Pac.† 1945	19,749	32,631	52,380	2.3	34,707	2,254	1,085	31.9	1,065	48.4	5,311	135	102.4
1944	23,367	31,982	55,349	1.3	34,662	2,215	1,082	32.5	1,045	46.1	5,145	129	97.1
Chi., St. P., Minneap. & Om. 1945	781	5,992	6,773	4.8	24,818	1,751	835	35.4	825	36.0	3,566	127	66.5
1944	1,000	7,364	8,364	3.9	27,309	1,880	874	32.6	806	37.1	4,042	117	69.8
Duluth, Missabe & I. R. 1945	15,025	574	15,599	3.3	14,897	1,118	540	31.2	31	1.6	876	209	21.2
1944	15,065	594	15,659	2.9	15,101	1,197	575	30.9	33	1.8	944	197	24.3
Great Northern 1945	19,575	15,582	35,157	1.9	36,294	2,341	1,129	31.7	1,182	51.5	5,222	119	88.9
1944	21,150	16,935	38,085	2.3	36,634	2,377	1,175	33.5	1,243	51.9	5,562	113	92.4
Min., St. P. & S. St. M.† 1945	5,277	5,213	10,490	4.0	28,992	1,663	794	31.7	962	44.2	2,535	114	110.0
1944	6,090	9,216	15,306	3.6	33,101	1,901	904	34.3	1,099	51.2	3,690	101	129.8
Northern Pacific 1945	13,765	19,470	33,235	2.8	41,979	2,735	1,394	34.4	1,294	51.1	6,716	144	87.3
1944	15,507	16,704	32,211	3.0	41,399	2,687	1,393	34.7	1,350	51.9	6,495	134	86.7
Central Western Region:													
Alton† 1945	1,387	7,149	8,536	2.1	36,862	1,726	734	27.1	772	38.3	7,134	142	125.2
1944	829	5,103	5,932	3.1	37,600	1,778	855	31.8	1,029	46.5	7,825	145	127.4
Atch., Top. & S. Fe incl. 1945	36,607	45,555	82,162	2.8	43,661	2,363	994	27.4	1,214	65.7	8,264	120	127.0
G. C. & S. F. & P. & S.F.) 1944	42,823	40,368	83,191	2.4	40,915	2,313	979	28.6	1,131	59.6	7,335	123	123.1
Chi., Burl. & Quincy 1945	16,201	27,113	43,314	2.9	40,466	2,541	1,236	33.0	1,286	56.3	6,331	121	93.1
1944	16,490	31,874	48,364	2.3	40,080	2,535	1,214	33.4	1,295	58.5	6,802	113	103.5
Chi., Rock I. & Pac.† 1945	9,509	23,567	33,076	3.5	33,821	1,929	891	28.8	1,228	58.6	5,286	125	109.0
1944	11,510	23,756	35,266	3.0	34,015	1,958	872	29.6	1,209	61.5	5,173	122	108.7
Denver & R. G. Wn.† 1945	7,610	6,284	13,894	4.8	33,932	2,132	1,094	32.6	1,083	42.5	6,411	181	88.8
1944	7,961	8,477	16,438	3.1	30,716	2,200	1,123	32.0	982	38.7	6,620	184	91.1
Southern Pacific—Pac. Lines 1945	22,504	55,119	77,923	2.3	37,796	2,720	1,156	27.7	1,059	56.1	10,294	106	110.1
1944	24,965	56,985	81,950	2.2	36,676	2,656	1,166	28.4	984	49.5	10,243	110	107.9
Union Pacific 1945	25,725	36,701	62,426	2.9	47,096	2,415	1,083	29.4	1,621	78.5	10,774	131	128.7
1944	26,225	40,162	66,387	2.6	42,700	2,322	1,039	29.4	1,563	74.5	10,636	136	137.0
Southwestern Region:													
Mo.-Kans.-Texas Lines 1945	1,217	7,833	9,050	.4	33,940	1,826	843	31.0	2,195	110.3	6,973	92	171.7
1944	2,113	7,078	9,191	.9	32,395	1,799	787	30.5	1,948	107.0	5,636	94	151.6
Missouri Pacific† 1945	11,967	24,463	36,430	1.5	40,016	2,364	1,094	31.0	1,563	74.6	8,552	114	121.0
1944	10,772	30,416	41,188	1.4	39,481	2,334	1,079	31.7	1,541	74.1	9,081	116	124.7
Texas & Pacific 1945	1,421	7,337	8,758	1.5	41,697	2,256	939	27.3	1,623	88.3	7,410	93	102.5
1944	1,746	6,404	8,150	1.1	39,112	2,138	894	27.2	1,459	81.1	6,504	99	102.0
St. Louis-San Francisco† 1945	5,583	11,964	17,547	2.1	31,726	1,584	758	30.7	1,444	65.2	5,728	146	113.3
1944	7,577	12,180	19,757	2.0	32,395	1,647	771	31.6	1,485	70.7	6,060	145	113.9
St. Louis-San Fran. & Texas 1945	.....	298	298	2.7	20,851	1,066	456	27.2	1,814	91.0	3,429	124	154.7
1944	.....	237	237	13.1	19,947	1,035	449	25.9	1,707	91.9	3,273	135	121.2
St. Louis Southw. Lines† 1945	980	7,201	8,181	1.4	33,884	2,143	943	27.1	1,813	92.2	9,616	91	126.5
1944	1,203	6,178	7,381	.8	34,186	2,088	903	27.3	2,208	121.5	9,900	91	129.1
Texas & New Orleans 1945	3,741	15,978	19,719	2.7	31,705	1,762	771	29.4	1,410	73.6	6,761	96	148.2
1944	4,197	19,575	23,772	1.8	31,236	1,828	784	29.1	1,277	68.1	6,802	94	145.7

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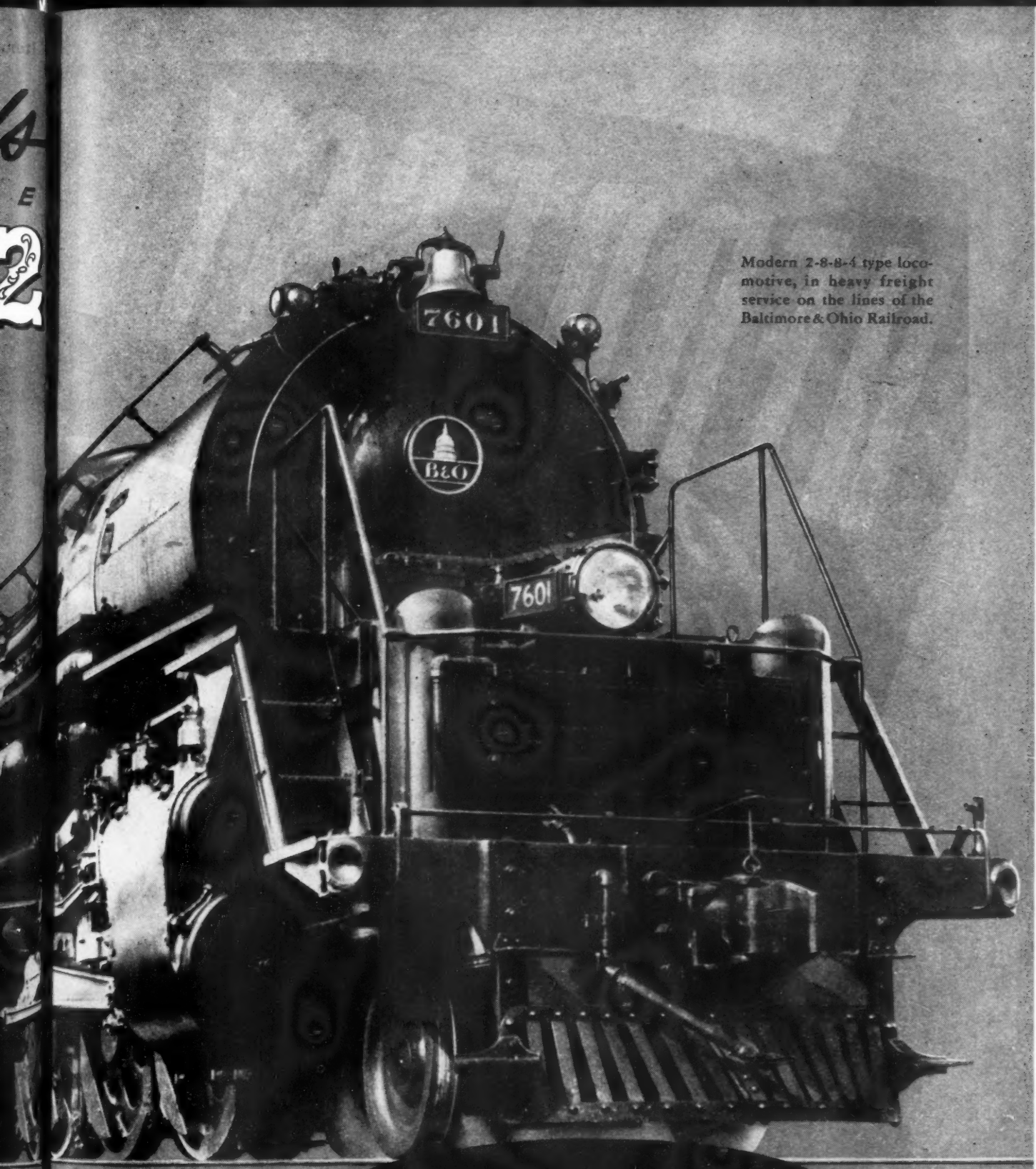

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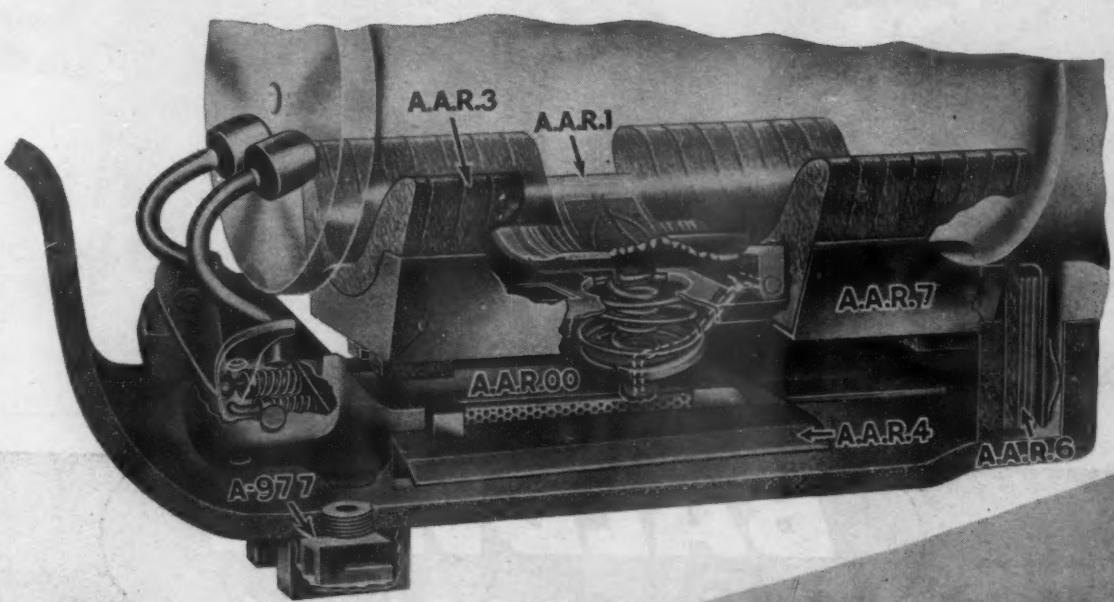

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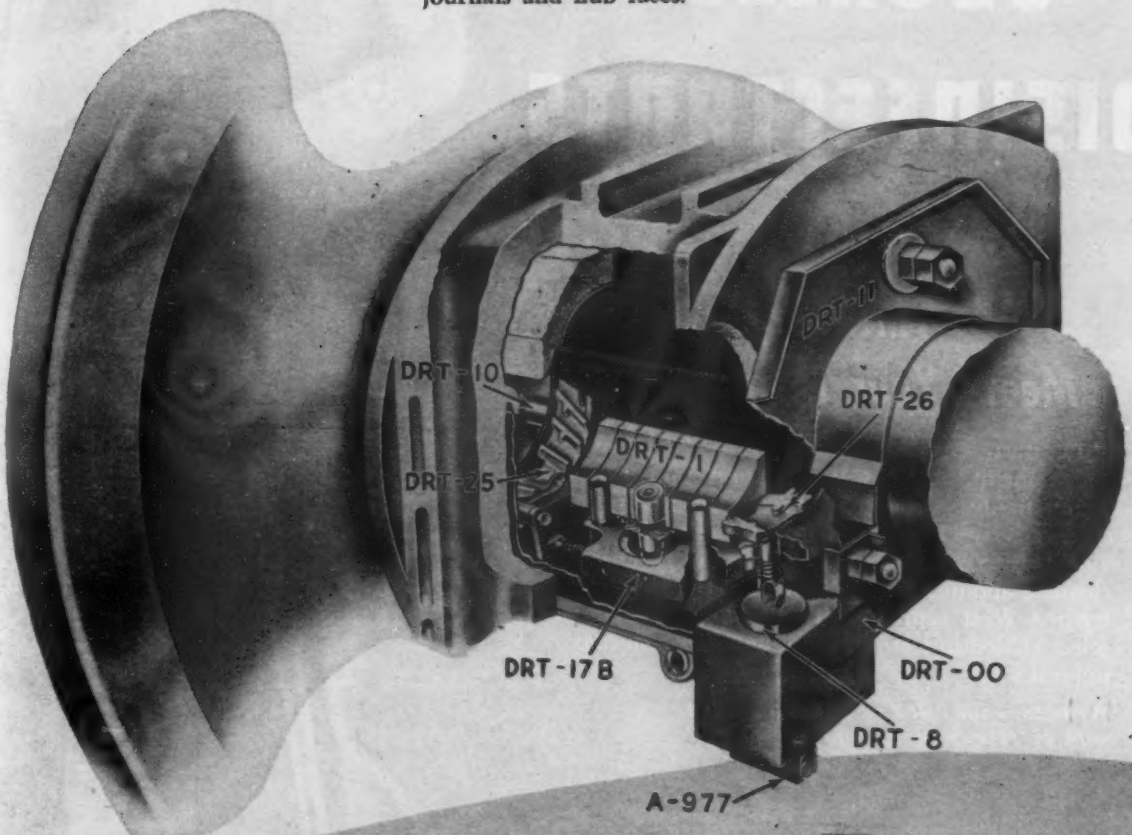

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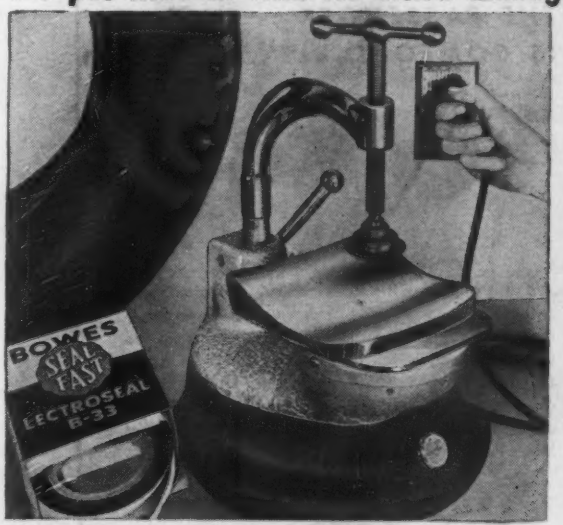

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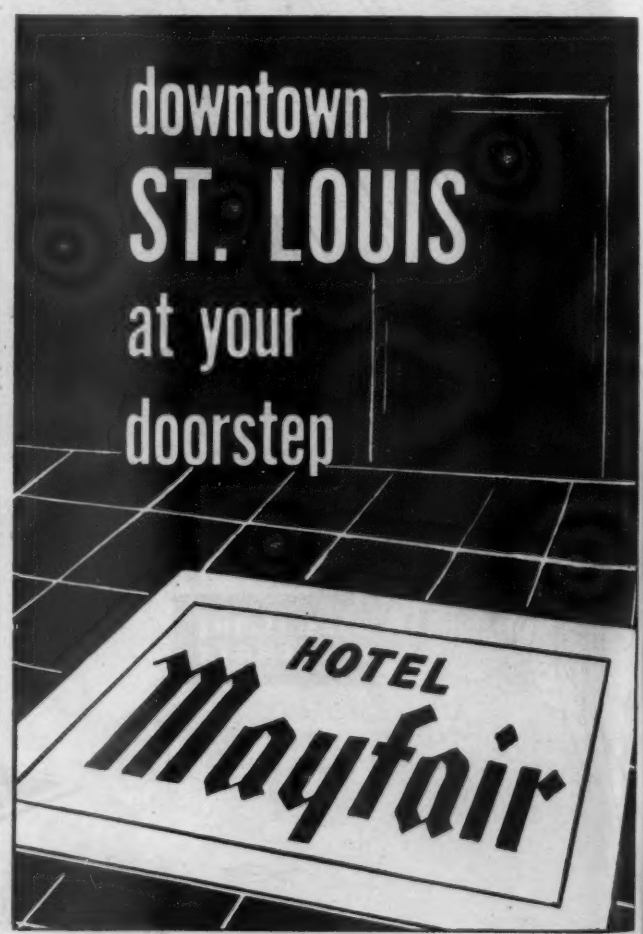

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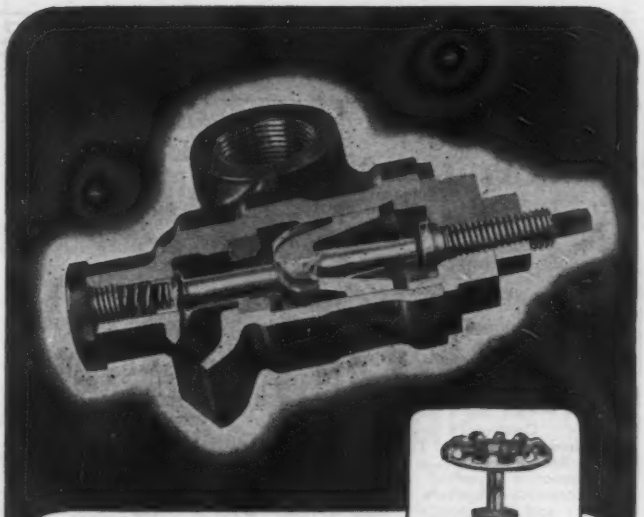

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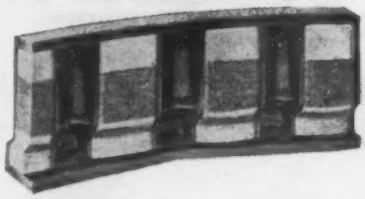

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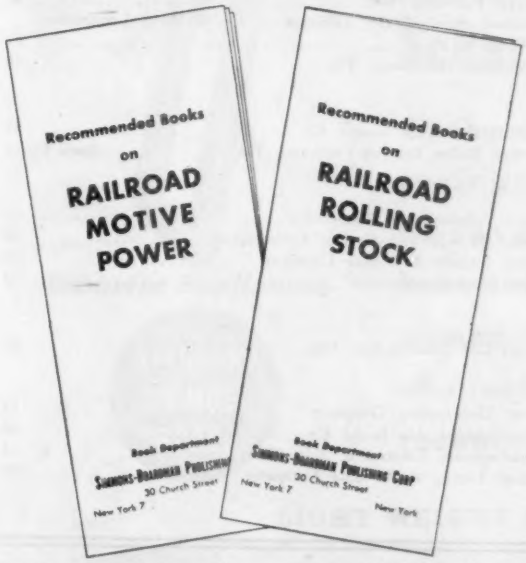

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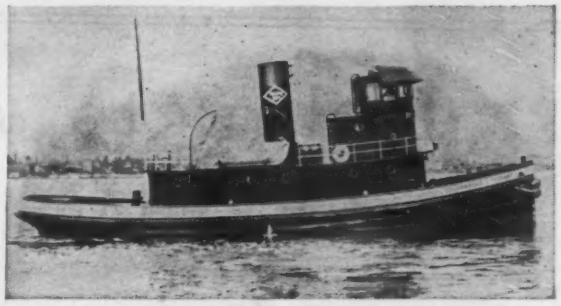

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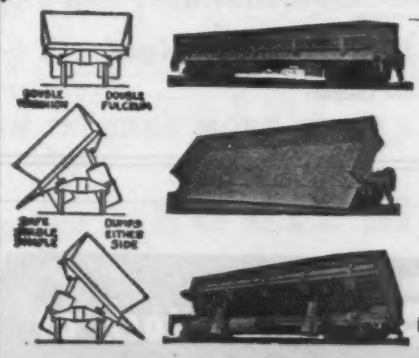

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Index to Advertisers

April 7, 1945

A

Aireon Manufacturing Corporation 34
American Arch Company, Inc. 47
American Brake Shoe Company, Ramapo Ajax Division 15
American Locomotive Company 7, 48a, 48b
American Optical Company 12
American Steel Foundries 25

B

Baldt Anchor, Chain & Forge Company 58
Baldwin Locomotive Works, The 21, 50, 51
Bethlehem Steel 6
Blanchard Bro. and Lane 56
Byers Company, A. M. ..... Front Cover

C

Carey Co., Inc., Thomas F. 58
Classified Advertisements 58
Corning Glass Works 30

D

Differential Steel Car Company 59

E

Electric Storage Battery Co., The 14
Electro-Motive Division, General Motors Corporation 44

F

Fabreeka Products Company, Inc. 18
Fairbanks, Morse & Co. 35
Fenwal, Incorporated 56
Finch Telecommunications, Inc. 24
Firestone Company 38
Flintkote Company, The 16
Franklin Railway Supply Company, Inc. 46

G

General American Transportation Corporation 20
General Cable Corporation 8, 9
General Electric Company 7
General Fireproofing Company, The 29
General Steel Castings 19
Get Together Department 58

H

Harbison-Walker Refractories Co. 47
Hennessy Lubricator Co., Inc. 52, 53
Holland Company 32
Hotel Mayfair 56
Hunt-Spiller Mfg. Corporation 49
Hyman-Michaels Company 59

I

International Correspondence Schools 58
Iron & Steel Products, Inc. 58

L

Lima Locomotive Works, Inc. 45
Locomotive Firebox Company 27

M

Magor Car Corporation 13
Mathis Co., John H. 59
Mearl Corporation, The 22
Miner, Inc., W. H. 3

N

National Lead Company 17
National Malleable and Steel Castings Co. 26
Nox-Rust Corporation 58

O

Okadee Company, The 57
Ohio Locomotive Crane Co. 59
Okonite Company, The 57
Oxweld Railroad Service Company, The 33

P

Philco Corporation, Storage Battery Division 39
Pittsburgh Steel Foundry Corporation 23
Portland Cement Association 36

R

Railway Educational Bureau, The 58
Republic Steel Corporation 31
Ryerson & Son, Inc., Joseph T. 62

S

Schaefer Equipment Company 63
Simmons-Boardman Publishing Corp. 59
SKF Industries 28
Socony-Vacuum Oil Company, Inc. 10, 11
Sonken-Galamba Corp. 58
Sperry Products, Inc. 37
Standard Steel Works, Division of The Baldwin Locomotive Works 21
Superheater Company, The 48

T

Thomas Truck & Caster Co. 57
Timken Roller Bearing Company, The ..... Back Cover

U

Union Asbestos and Rubber Co. 55
Union Carbide and Carbon Corporation 33
Union Switch & Signal Company 42
Unit Truck Corporation 2

V

Vapor Car Heating Co., Inc., ... 59

W

West Disinfecting Company 54
Westinghouse Air Brake Co. 40
Westinghouse Electric & Mfg. Co. 4, 5
Wheel Truing Brake Shoe Company 59

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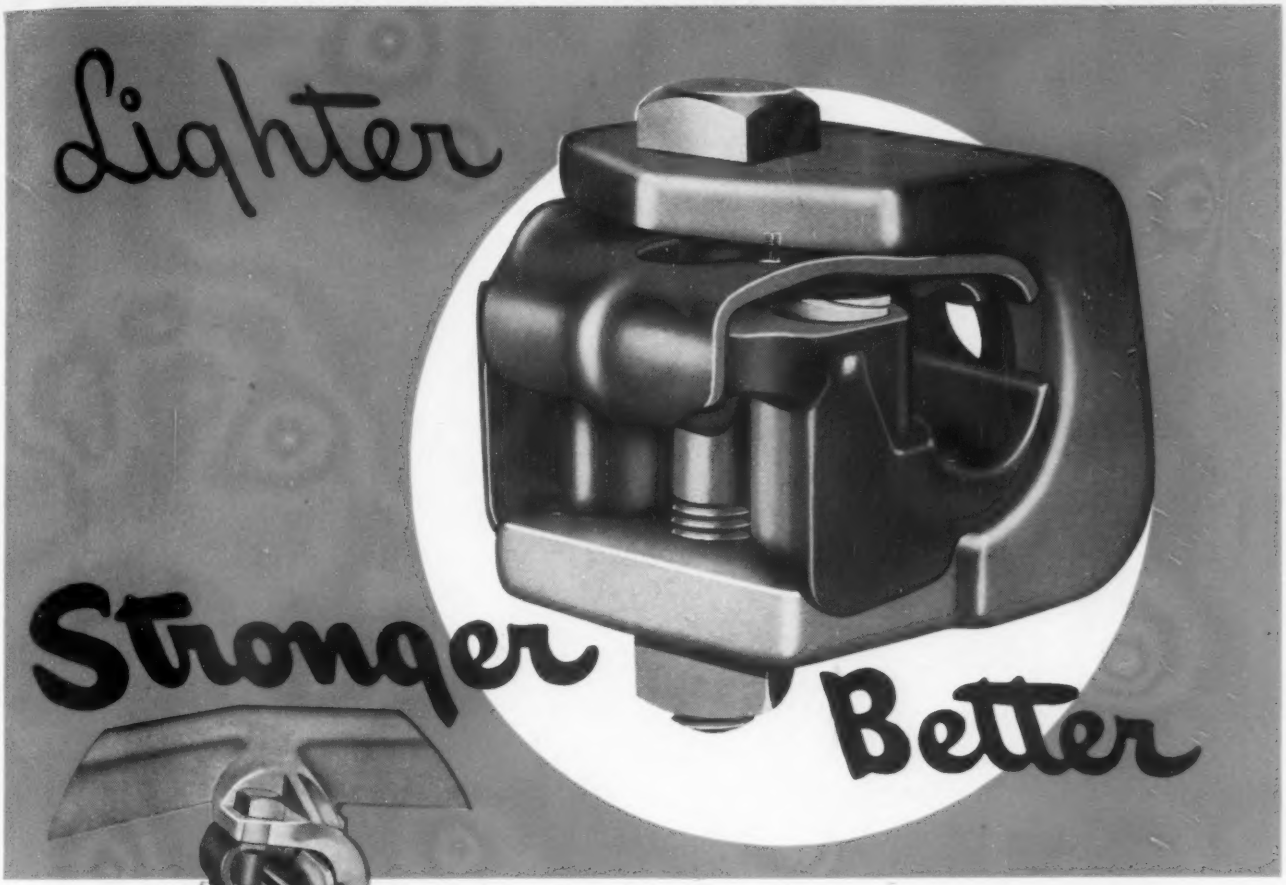

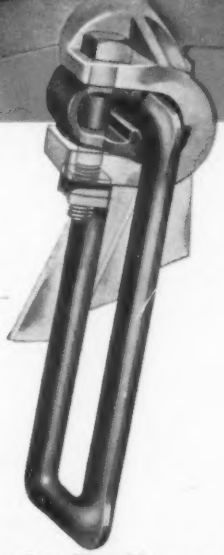

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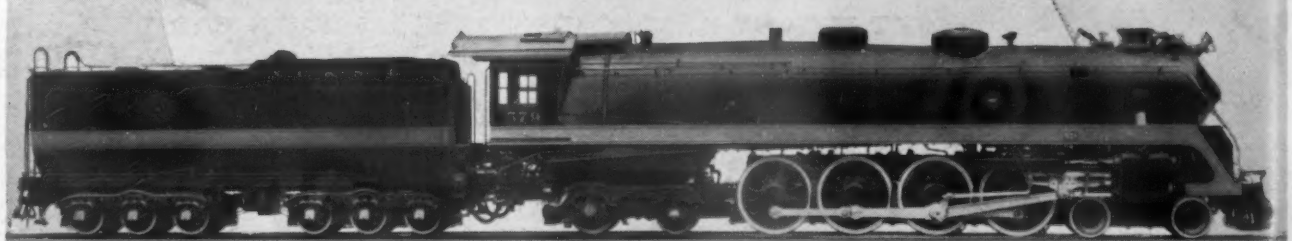

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